PROGRESS REPORT FOR ARMY FUNDED ACTIVITIES AT ROCKY MOUNTAIN ARSENAL NATIONAL WILDLIFE REFUGE

Commerce City, Colorado

Fiscal Year 2010

U.S. Department of the Interior
U.S. Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

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Introduction

The Rocky Mountain Arsenal (RMA) was established by the U.S. Army (Army) in 1942 as a chemical and incendiary weapons manufacturing facility in support of U.S. military efforts during World War II. Following the war, the Army leased some facilities to the Shell Chemical Company (Shell) for production of pesticides and other chemicals. Weapons production ended in 1969, but the Army continued to use RMA for demilitarization of chemical munitions and other defense uses until 1984. Pesticide production by Shell Chemical Company ceased at the Arsenal in 1982.

During the military/industrial production years, waste handling practices resulted in contamination of soils, structures and groundwater at this site. RMA was added to the National Priorities List (Superfund) in 1987. In 1992, Congress passed the Rocky Mountain Arsenal National Wildlife Refuge Act (P. L. 102-402), designating the future use of the site as a National Wildlife Refuge (NWR), mandating the Fish and Wildlife Service (Service) manage RMA "as if it were" a unit of the National Wildlife Refuge System (NWRS) during the environmental cleanup. All RMA lands were brought into the Refuge System under a "secondary jurisdiction/overlay" Memorandum of Understanding in 1993.

The Record of Decision (ROD) for the On-Post Operable Unit of RMA was signed in 1996. Shortly thereafter, the Service joined the Army and Shell in forming the Remediation Venture Office (RVO), a unique partnership with the dual missions of implementing a safe, cost effective cleanup of RMA and converting the site to its current status as a National Wildlife Refuge.

Just 10 miles from downtown Denver, Colorado, within a rapidly developing urban interface in Commerce City, Adams County; Rocky Mountain Arsenal National Wildlife Refuge (RMANWR) is the largest wildlife habitat area in metropolitan Denver at 15,000 acres (the U.S. Army maintains jurisdiction over about 1,000 acres). Located in the heart of Region 6's largest urban area, and with more Americans living within a 1-hour drive than live in all of North and South Dakota, Wyoming, and Montana combined, RMANWR provides an outstanding opportunity for the Refuge System to expose the public, particularly urban youth, to the values that wildlife and refuges provide to our society.

Refuge wildlife include a significant wintering population of bald eagles (*Haliaeetus leucocephalus*), one of the largest breeding burrowing owl (*Athene cunicularia*) populations in Colorado, and a myriad of other migratory birds and resident wildlife. RMANWR is becoming well known for its herd of American bison (*Bison bison*), currently over 70 animals, which were introduced in 2006. Due to past land uses, including agricultural conversion, military/industrial use, and the cleanup of these sites, most native habitats have been destroyed or degraded. An established weed seed bank has made management of invasive species a priority at the refuge. Habitat management is currently focused on restoring native shortgrass and midgrass (mixed grass) prairie plant communities (approximately 10,100 acres) and emulating natural ecological processes.

The Cooperative Agreement for Conservation and Management of Fish and Wildlife Resources at Rocky Mountain Arsenal (5th Revision) was signed by representatives of the Service and the Army in 2009. The annual schedule of operations for 2010 provides an outline for what is to be

done during the fiscal year (October 1st 2009 through September 30th, 2010). This report follows that outline, which documents Service support to the Army in the areas of Mitigation/Restoration, Remedy/Cleanup, and Access Control.

A. Mitigation and Restoration Work Related to Remediation of RMA

A.1 Restoration of Native Shortgrass and Mixed Grass Prairie

Two basic prairie types are seeded as part of the restoration effort at the Rocky Mountain Arsenal National Wildlife Refuge. Project sites with heavier textured soils, such as Weld or Santana, are seeded to a shortgrass prairie mix. Project sites with sandier textured soils such as Ascalon or Bresser, are seeded to become mixed-grass prairie. Typically, all seeded project sites receive irrigation during the first growing season, but in FY 2010, no sites received irrigation except those done by the irrigation contractor.

A.1.a. Permanent Native Seeding

Approximately 1,126 acres were seeded with native seed:

Section	Project Number	Seeded Date	Prairie Type	Irrigated/ Non- irrigated	Acres
1,2	F16	Winter 2009	Mixed Grass	Non-irrigated	183.9
3	F26	Winter 2009	Mixed Grass	Non-irrigated	261.4
4	F17	Winter 2009	Mixed Grass	Non-irrigated	21.6
8	F11	Spring 2010	Mixed Grass	Non-irrigated	19.7
19	F27	Spring 2010	Mixed Grass	Non-irrigated	195.8
25	F22	Spring 2010	Shortgrass	Non-irrigated	266.4
29	F58	Winter 2009	Mixed Grass	Non-irrigated	8
30	F24	Winter 2009	Mixed Grass	Non-irrigated	58
34	F36	Winter 2009	Mixed Grass	Non-irrigated	15
36	F15	Winter 2009	Mixed Grass	Non-irrigated	99.7
				Total	**1,126.5**

Table A.1.a.1. FY 2010 permanent native seeding date, type, irrigation and acreage, RMANWR

A.1.b. Cover Crop Seeding

Cover crop seeding is part of a two-year (sometimes longer) weed control period given to all new project seedbeds. Cover crops provide temporary food and cover for wildlife, prevent soil erosion, collect additional moisture in winter, preserve existing soil moisture, shade out weeds, and provide additional organic matter to the soil. Seeding directly into one- or two-year-old mowed cover crop stubble also saves the cost of having to use weed-free hay mulch. Cover crop seeding is part of a conservation tillage system the Service adopted to manage levels of plant residue on seedbeds. This technique helps provide the above benefits with as little mechanical cultivation as possible.

In FY 2010, approximately 772 acres were seeded with cover crops:

Section	Project Number	Crop Seeded	Acres
24	N/A	Sorghum	43.6
31 & 32	F35	Sorghum	180
36	F30	Sorghum	144
26 & 35	F32	Sorghum	349.3
29 & 32	F23	Sorghum	42.2
25 & 30	F25	Sorghum	13
		Total	**772.1**

Table A.1.b.1. FY 2010 cover crop seeding, RMANWR

A.1.c. Seedbed Preparation

Restoration seedbeds go through a two-year fallow period prior to permanent seeding, during which time all germinating weeds are controlled by a variety of mechanical (plowing, disking, mowing), and chemical means. Mowing is used to prevent unwanted plants from maturing and producing seed. Disking is used to break up the soil, the vegetation, and root systems. Plowing also breaks up the soil and mixes the vegetation residue in with the soil.

Seedbed preparation entails the above techniques to deplete the existing weed seedbank, minimizing weedy competitors and encouraging germination of newly seeded native vegetation. The following tables list the projects that received mechanical and chemical weed control as part of this fallow period prior to their scheduled permanent seeding:

Section	Project	Action	Site Acres
19	F27	Mowing	180
25	F22	Mowing	266
		****Subtotal**	**446**
1 & 2	F16	Disking	158.3
8	F11	Disking	19.7
19	F27	Disking	19.7
25	F22	Disking	65
29	F58	Disking	18
31 & 32	F35	Disking	180
34	F36	Disking	15
36	F30	Disking	144
26 & 35	F32	Disking	349.3
29 & 32	F23	Disking	42.2
25 & 30	F25	Disking	65
		****Subtotal**	**1,076.2**
23	F49	Plowing	106
25	F22	Plowing	65
26	F31	Plowing	191.6
		****Subtotal**	**362.6**
1 & 2	F16	Harrow	158.3
3	F26	Harrow	38
8	F11	Harrow	19.7
19	F27	Harrow	19.7
25	F22	Harrow	65
		****Subtotal**	**300.7**
		Mechanical Site Preparation Total	**2,185.5**
** Most project sites had mechanical treatment at least twice			

Table A.1.c.1 FY 2010 mechanical site preparation and type of activity, RMANWR.

Section	Project	Action	Acres
3	F26	Spray- 05/2010 Roundup (1 qt./ac)	11.25
20	F40	Spray- 04/2010	248
23	F48	Spray- 04/2010 Roundup (2 qt./ac)	36.58
24	F57	Spray- 06/2010 Roundup (1.53)	24.83
25	F28	Spray- 10/2009 Roundup, 2, 4-d (2.26 qt. /ac.)	17.52
25	F22	Spray- 10/2009 Roundup/2,4-d	36
26	F31	Spray- 06/2010 Roundup/dicamba (2qt. /ac.)	124.18
29	F44	Spray- 05/2010 2,4-d /dicamba(2.4 qt.ac)	88.72
29	F64	Spray- 08/2010 Roundup / 2, 4-d (2.4 qt. /ac.)	22.81
31	F34	Spray- 06/2010 Roundup (2 qt./ac)	91
36	F30	Spray- 05/2010 Roundup (2 qt./ac)	76.94
Helicopter application, sections 20,23,24,26,29,31,35,36		Spray- 08/2010 Roundup, dicamba (Kochia)	1,007
		Chemical Site Preparation Total	**1,536.83**
		Total Seedbed Preparation	**3,722.33**

Table A.1.c.2 FY 2010 chemical site preparation by project and chemical applied, RMANWR.

A.1.d. Habitat Maintenance Performed on New Restoration Projects

New restoration projects that have been seeded typically do not receive herbicide treatments due to the risk of damaging sprouting vegetation. The most common maintenance for new restoration projects is mowing broad-leafed weeds to no more than one foot in height to prevent shading of emergent vegetation. By mowing the broadleaves, light is able to reach the understory so that native seeds can germinate and grow. Typically, new restoration projects need to be mowed two or three times during the first growing season depending on precipitation.

The following are projects in the first growing season that had to be mowed in FY 2010:

Section	Project	Treatment	Site Acres	Treated Acres
1 & 2	F16	Mowing	116.3	107
3	F26	Mowing	209.7	132
4	F60	Mowing	135.1	130
5	F01/08	Mowing	209.9	200
8	F11	Mowing	101.8	100
11	nr	Mowing	n/a	15
12	nr	Mowing	n/a	20
24	F21	Mowing	111.2	90
24	F57	Mowing	43.2	40
24	F54	Mowing	140	86
24	F42	Mowing	16.2	10
24	nr	Mowing	n/a	23
25	F22	Mowing	249.8	150
26	F31	Mowing	191.6	65
27	pasture	Mowing	1500	17
29	F23	Mowing	78.7	55
30	F24	Mowing	50.7	50
31	F34	Mowing	127.2	45
31	F35	Mowing	158.9	120.7
31	F37	Mowing	80.4	80
32	F23	Mowing	43.1	30
33	nr	Mowing	n/a	90
35	F32	Mowing	214.5	21.5
36	F30	Mowing	153.8	130
			Total	**1,713.7**

Table A.1.d.1. First-year projects and acreage mowed in FY 2010, RMANWR.

A.2. Maintenance and Monitoring on Habitat Restored in Prior Years

A.2.a. Habitat Maintenance Performed on Prior Restoration Seedings

The following table shows chemical treatment performed on permanently seeded restoration projects. Staying on top of project maintenance is a crucial part of the restoration effort allowing staff to control weeds and prevent them from setting seed. The following areas were treated in FY 2010:

Section	Project	Action	Acres
1	79	Spray 10/2009	42
1	F06	Spray 07/2010 2, 4-d / dicamba (2.1 pt. /ac.)	39
1	55	Spray 10/2009 Plateau (3.8 oz./ac)	15
1	F06	Spray 10/2009 Plateau (4.4 oz./ac)	43.65
2	53	Spray 08/2010 Escort (1.5 oz./ac)	5
2	34	Spray 07/2010	13
2	F46	Spray 06/2010 Roundup (2 qt./ac)	7
3	63	Spray 08/2010 Plateau (4 oz. /ac.)	21
3	41-06	Spray 10/2009 Plateau (5 oz. /ac.)	18
5	F08	Spray 07/2010 2, 4-d / dicamba	127.21
5	F01	Spray 07/2010 2, 4-d / dicamba	13
6	79	Spray 07/2010 Escort (1.5 oz. /ac.)	38.4
6	79-03	Spray 10/2009	61.3
6	84	Spray 10/2009 Plateau (4.2 oz./ac)	13.49
6	F10	Spray 10/2009 Plateau (4.2 oz./ac)	17.62
7	88	Spray 08/2010	13
7	67b & 88	Spray 08/2010	36
7	67c	Spray 08/2010 Escort (1.5 oz. /ac.)	26
8	F11	Spray 07/2010 2, 4-d dicamba	70
8	11	Spray 07/2010 2, 4-d dicamba	106
11	59 & 90	Spray 08/2010 Escort (1.5 oz. /ac.)	24
11	F02	Spray 08/2010 Escort (1.5 oz. /ac.)	14
11	90	Spray 10/2009 Plateau (4.2 oz./ac)	4.33
11	F19	Spray 10/2009 Plateau (5 oz. /ac.)	36
12	54-04	Spray 10/2009 Plateau (4.4 oz./ac)	96.02
12	91a	Spray 10/2009 Plateau	115.97
12	55 & 91a	Spray 07/2010 2, 4-d / dicamba	38
12	55	Spray 10/2009 Plateau (4.75 oz. /ac.)	4.4
12	42	Spray 10/2009 Plateau (3.96 oz. /ac.)	5
12	54	Spray 10/2009 Plateau (3.977 oz. /ac.)	24.78
12	91b	Spray 10/2009 Plateau (4.07 oz. /ac.)	109.97
27	Pasture	Spray 06/2010	131.2
30	F13	Spray 06/2010 2, 4-d / dicamba	42.24
30	F12	Spray 10/2009 Plateau (4 oz. / ac.)	3.57
30	F30	Spray 10/2009	25.86
32	F04	Spray 08/2010 2, 4-d / dicamba	14.78
36	F30	Spray 05/2010 Plateau (4.35 oz. /ac.)	13
		Total	**1,428.79**

Table A.2.a.1. Habitat maintenance performed on permanently seeded projects in FY 2010, RMANWR.

A.2.b. Integrated Pest Management Program (IPM)

Introduction

The State of Colorado Noxious weed list includes 71 weed species, 26 of which occur or have occurred on the Refuge. Weed species pose a significant threat to habitat restoration efforts by outcompeting native vegetation. The Service therefore employs an Integrated Pest Management (IPM) approach to weed control which utilizes mechanical, biological, chemical, and cultural (prescribed burns) methods as appropriate throughout the Refuge.

Methods

The Service used nineteen Pesticide Use Proposals (PUP's), approved by the Refuge Project Leader, for treating the increasing acres and diversity of weeds in FY 2010. These PUP's have been submitted for re-approval for FY 2011. The existing Refuge IPM plan expired in October of 2008 and a new plan is currently being reviewed. Once approved, it will be valid through 2015.

New restoration projects typically receive two years of weed control in an attempt to exhaust the existing weed seedbank. These areas are closely monitored to observe weed phenology and germination in order to determine the best chemical control.

The Service continues to utilize contract helicopters as a cost effective method to apply herbicides to large areas. Seventeen-hundred acres were sprayed in FY 2010, most with glyphosate and some with dicamba. Depending on the proximity of spray sites to each other, the helicopter can spray up to 100 acres per hour. The speed at which this operation is completed allows for a more temporally relevant application while the use of GPS technology prevents "striping", a phenomenon associated with ground-spraying rigs when not enough overlap occurs between spray passes.

Mechanical methods were also used to control a variety of weeds outside habitat restoration areas. These methods included mowing, digging, hand pulling and light disking. In FY 2010, Mile High Youth Corps crews removed 434 Russian olive (*Elaeagnus angustifolia*) trees and, along with other volunteer groups, surveyed and treated 170 acres of houndstongue (*Cynoglossum officinale*).

The following table shows chemical weed control that was completed in non-restoration project areas throughout the Refuge. Nearly all these areas are adjacent to existing restoration projects, with some being newly seeded while others are in remnant vegetation communities which require protection from degradation by weed species.

Section	Project	Action	Site Acres
1	NR	Spray 04/2010	42.85
2	NR	Spray 09/2010	12
3	NR	Spray 10/2009	66.94
5	NR	Spray 10/2009	32
6	NR	Spray 10/2009	5.5
7	NR	Spray 10/2009	42.3
11	NR	Spray 10/2009	174.83
12	NR	Spray 10/2009	100.64
27	NR	Spray 10/2009	247.51
28	NR	Spray 10/2009	106.1
33	NR	Spray 06/2010	133.1
35	NR	Spray 08/2010	8.1
		Total	**971.87**

Table A.2.b.1. IPM weed control conducted on projects in FY 2010, RMANWR.

Results and Discussion

In FY 2010, a total of 3,937.49 acres received chemical control for exotic or invasive species, 1,739.5 acres were mechanically tilled, and 2,159.7 acres were mowed. In addition, 1,898.6 acres were seeded to either permanent or cover crops.

A.2.c. Vegetation Monitoring

Introduction

The objectives of the vegetation monitoring program are to:

1. Objectively assess the overall success of habitat restoration efforts by comparing baseline vegetation data with post-implementation data.
2. Determine if seeded species are represented in the vegetative community in the same proportion as they were seeded.
3. Reveal which species have established the most and least successfully from the overall seed mix on the restoration site.
4. Determine the actual composition, density, and diversity of seeded sites over time to determine range trend and condition.

Methods

Data is collected from randomly placed 50-meter fixed point-line transects. Points along the transects are placed at one meter intervals, a half-meter on each side of the transect and observed using an Optical Sighting Device (OSD) placed directly overhead and perpendicular to it. The general rule is a minimum of one transect for each restoration project with one transect for every six acres, and a maximum of 20 transects per site. Baseline data is ideally taken prior to restoration field work commencing on an area. Once an area is seeded, vegetation monitoring takes place in the third and fifth growing season and then every five years thereafter until restoration sites become successful according to the established criteria.

Results and Discussions

A total of 196 transects were sampled in 22 projects in FY 2010. Success status and data analysis for the following projects are not stated in this report due to an inability to access the vegetation monitoring database that has been used in previous years to calculate success of restoration stands and track changes in vegetation trends.

Project	# of Transects	Section	Acres	Date Seeded
Project 3B	8	2	8.7	Fall 1993
41-04	2	20	10.8	Fall 2003 Spring 2004
Project 41	1	4	0.95	Spring 2006
41C	2	7	13.2	Spring 1998
62	12	5	46.8	Spring 1996
Project 68	17	8	89.1	Fall 2002
Project 69	16	19, 20, 29, 30	108.1	Fall 2000
70	3	69	3.5	Fall 1999
Plan 72	20	32	468.7	Fall 2000 Spring 2001
Project 73	3	3	15.6	Spring 2001
Project 80	14	5	84.8	Fall 2002
83	3	2	13.5	Fall 2004
87A/ F12	20	30	170.4	Spring 2008
F06	6	1	32.9	Spring 2008
F09	7	6	39.6	Spring 2008
F10	3	6	14.6	Spring 2008
Rattlesnake Hill	7	35	UNSURE	UNSURE
Sage Shrubland	20	8	116.6	UNSURE
Remnant area: Section 33 Native	20	33	318.8	UNSURE
Site 1A	4	5	20.4	UNSURE
Site 1B	8	8	48.4	UNSURE

Table A.2.c.1. Summary of vegetation monitoring efforts in FY 2010, RMANWR.

B. Remedy and Cleanup Activities and Support to Army and Remediation Venture Office

B.1. Wildlife Health Monitoring Studies and Designated Species Collections per the Contaminant Biomonitoring Plan

B.1.a. American Kestrel Population Monitoring FY 2010

Background

The American kestrel (*Falco sparverius*) was selected as one of the sentinel species for the refuge biomonitoring program because its foraging activities result in bioaccumulation of Persistent Organic Pollutants (POPs) from insects and small mammals, aldrin and dieldrin being the chief chemicals of concern at RMANWR (see the BMP for a complete description).

Introduction

American kestrel nest box sites were monitored in prior years for reproductive success and banding opportunities, however FY 2010 was the first year scheduled for collecting eggs for contaminant analysis. Collection of the eggs will occur for a minimum of three consecutive years; the BMP directs collection of three years of samples per site. Collection proceeds as a 2-phase process: Phase 1 – Detection of Dieldrin Levels in Eggs, and Phase 2 – Detection of Dieldrin in Brains (only if needed). Phase 1 evaluates dieldrin concentration in eggs at both the individual nest box site and by groups of nest boxes for exceedance of detection limits above No Observable Adverse Effect Concentrations (NOAEC, 0.5µg/g) and Maximum Allowable Total Concentration (MATC, 1.0µg/g). If dieldrin concentrations at one or more sites exceed the MATC, the BMP directs implementation of Phase 2 requiring the collection of a chick and evaluation of dieldrin concentrations in brain tissue. Monitoring activities in FY2010 only relate to Phase 1 – Detection of Dieldrin Levels in Eggs.

There are 37 nest boxes situated within the boundaries of RMANWR, each located approximately one mile apart in each direction at or near the intersection of primary and secondary roads and along perimeter fences. The locations are categorized as "core" and "periphery" with 12 core and 15 periphery nest boxes. This accommodates biomonitoring of the forage and reproductive range of nesting kestrels utilizing the nest boxes throughout the Arsenal, although periphery nest boxes accommodate birds potentially foraging both within and outside of the Arsenal boundaries.

Personnel

Biomonitoring activities were directed and supervised by RMANWR senior biologist Sherry Skipper. Field activities were coordinated and conducted by Brian Fairchild, Biological Science Technician (STEP student), with additional assistance during the summer months from Leeland Murray, Biological Science Technician (STEP student). In addition, intermittent assistance was provided throughout the summer by 5 other Biological Science Technicians (SCEP/STEP students), and volunteers.

Pre-season Activities

Nest box maintenance was conducted between October 2009 and February 2010. Nest boxes at 25NE, 31NW, 32SW, and 35SE were reinstalled at or within close proximity to previously monitored locations where a nest box was previously removed or closed due to remediation activities. To prevent predation from raccoons (*Procyon lotor*) and snakes without deterring kestrel nesting, sheet metal predator guards were designed, constructed, and installed on nest box posts prior to the reproductive season (Figure B.1.a.2). Additional nest box maintenance included repainting identification numbers, modification to permit easier cleaning, and pre-season filling of with aspen chips.

Final maintenance checks occurred between 3 February 2010 and 18 February 2010. While conducting maintenance, observation of nine males (some vocalization noted), one banded female, three kestrel pairs, feces, and pellets inside nest boxes, indicated 14 sites were potential nests while two European starlings (*Sturnus vulgaris*) were also observed in boxes.

The skeletal remains of three kestrel chicks and three horned larks (*Eremophila alpestris*) were discovered in box 20NE when performing maintenance on 4 Feb 2010, indicated the possible abandonment of a clutch last observed in 2009, an atypical late season clutch, or possible abandonment of prey items.

Biomonitoring Field Activities

Monitoring occurred from March 2 – July 26, 2010 approximately twice weekly; typical activities for box checks included:

- Scheduling route based on field/remediation activities
- Equipment preparation including: 4WD pick-up trucks for transporting personnel and equipment, 10’ aluminum ladder, 12’ hole-pole (devised to preclude escape of adults/fledglings while conducting band checks), collecting screw drivers, data sheets, writing instruments, certified clean jars, Ziploc bags, safety glasses, leather and nitrile gloves, dust masks, and a cooler with H_2O ice
- Carrying ladder and equipment to nest box while observing kestrel activity (i.e. in adjacent trees, on telephone poles, in flight, eggs on ground, raptor pellets, etc.), tripping hazards, disturbance issues, and snakes or other hazards
- Blocking the nest box entry/exit hole with hole-pole or folded glove after climbing ladder (if hole-pole is not used)
- Setting up and climbing the ladder, and accessing the nest box through its side panel
- Observing for adults and bands (handling bird if present), presentations (i.e. captured prey or grasshoppers), copulations (rare), incubations, eggs, hatchlings, fledglings, or other activities (i.e. starling nest-building, flicker pellets, etc.) (Figure B.1.a.3)
- Marking and collecting eggs or dead chicks (if appropriate and they provide a viable sample)
- Recording observations/collection data
- Closing nest box access panel, climbing down ladder with samples and equipment, carrying ladder and returning to vehicle with samples and equipment

- Storing collected samples in cooler with H_2O ice
- Storing samples in chest freezers in the preparation lab upon return from the field
- Transferring data to an Excel spreadsheet, noting maintenance needs not addressed in the field, ensuring banding of fledglings is coordinated and scheduled as needed, and field data sheets are filed in binders

In FY 2010, a total of 938 nest box visits were conducted, averaging 25.4 checks per box including visits for maintenance, monitoring reproductive activities, egg collections, band checks, banding fledglings, and removal of European starling nests. Reproductive activities were observed and recorded on the Rocky Mountain Arsenal NWR American Kestrel Nest Visit Data Form.

Nesting Activity

Several individuals were observed courting, vocalizing, and defending nest boxes throughout March and early April as they competed for nest sites. The first eggs of the season were observed on April 6th when a total of 10 eggs were laid in five periphery and one core nest box. Reproductive activity concluded on July 26th with the collection of a non-viable egg.

Of the 37 nest boxes, reproductive activity occurred in 29, 8 in core nest boxes and 21 in the periphery (Table B.1.a.1). One periphery nest box (33NW) had intermittent activity, but no clutch was initiated. European starlings attempted to nest in 7 nest boxes, 4 in the core and 3 in the periphery.

Nest Box Usage	Core (22)	Periphery (15)	Total (37)
# of boxes used for reproduction	8	21	29
% Nest box used	66.7	84	78.4

Table B.1.a.1 FY 2010 American Kestrel nest box usage, RMANWR.

AK Nesting Activity	Core (n=12)	Periphery (n=25)	Total (n=37)
Nest Attempts	8	26	34
Abrupt Ends	4	19	23
% Nest Failures	50	73.1	67.7

Table B.1.a.2 FY 2010 American Kestrel nesting activity, RMANWR

There were 34 kestrel nest attempts throughout the reproductive season, eight in core nests and 26 in the periphery. Twenty-nine nest boxes had single clutches initiated and five had two clutch initiations, all of which occurred in periphery nests. Eleven of the 34 clutches initiated were successful (having at least one fledgling), resulting in a reproductive success rate of 32.4%. Of the 23 unsuccessful clutches, a total of four initiated in the core and 19 in the periphery came to an abrupt end (Table B.1.a.2). The majority of abrupt ends were associated with nest site competition from European starlings with 207 nest attempts throughout the season. All non-target species nests were removed to promote kestrel nesting. The demise of the remaining clutches was due to nest abandonment because of unknown causes, including possible predation.

Eggs Collected

The BMP egg collection protocol directs collection of one random egg per clutch, however RMANWR senior biologist Sherry Skipper directed collection of the first egg laid in each clutch based on additional research. Throughout the reproductive season a total of 120 eggs were laid (32 in the core and 88 in periphery nest boxes). Forty-three eggs developed into nestlings and 35 progressed to fledglings resulting in an egg, a hatch rate of 36.4%. Thirty-four eggs disappeared, mostly from nests with competition from European starlings.

A total of 38 eggs were collected for contaminant analysis: 10 from core and 28 from periphery nest boxes. Some eggs were not viable samples, and a total of 29 eggs were submitted to the National Wildlife Research Center (NWRC) in Fort Collins, CO for contaminant analysis. Eggs laid were sequentially marked during each visit, and technicians collected the first laid in each clutch. Eggs were placed in a certified-clean 2 oz. glass jar lined with VWR light-duty tissue wipes to prevent breaking during handling and transport. These were placed in a cooler containing H_2O ice to halt development, then stored in a freezer at -20^oC upon return from the field.

In addition to collection and submission of eggs for contaminant analysis, the USFWS banded fledglings in successful nests and conducted band checks on adults observed in nest boxes. A total of 32 nestlings were banded, 13 from core nest boxes and 19 from the periphery. Band checks on adults aided in discerning if any birds returned from previous years, 40 checks on females, and 4 checks on males were conducted. One female adult at 23NW was a returning bird and initiated a clutch of eggs, however the clutch began to decline and all eggs disappeared within 3 weeks after collection of the initial egg.

Disturbances and Activities Possibly Impacting Kestrel Reproduction

Perimeter fence set-backs and construction accommodating the Commerce City hike/bike path along the west, north, and east perimeter during FY 2010 had no apparent or significant impacts on kestrel reproduction, while all other nest box sites had adequate forage habitat except as indicated. Activities that might have impacted nest sites are as follows:

- Box 11SW: High traffic area with box located near South Gate (Havana St. and 56th Ave)
- Box 23NW, 26NW, and 27NW: A large number of prairie dogs (*Cynomys ludovicianus*) were re-located from other remediation/restoration sites into Section 22, reducing the amount of vegetation where kestrel prey items are typically found.
- Box 23NW, 24NW, 25NW, 26NW, and 35NW: Disturbance from restoration activities may have negatively impacted reproductive activity by reducing available forage habitat; rough furrows were ripped, and eventually raked and seeded throughout the southern half of Section 23 and western half of Section 26.
- Box 31NW: Disturbance from restoration activities may have negatively impacted reproductive activity. Throughout most of the spring there was approximately a 1/4-mile x 1/3 mile of deep furrowed/tilled soil south of 8th Ave from the 2-track road in 36NC (NE corner of ICS) to 1st Creek in 31NW. Rough furrows were ripped and eventually raked and seeded. No vegetation was in the immediate forage area of the box, but adequate forage habitat was established north of the box in Sections 25 and 30.

- Box 32SW: The nest box was re-installed prior to the reproductive season, and had been absent for several years. It was placed approximately 50 meters northwest across F Street from its original location due to tree growth inhibiting use by kestrels.
- Box 35SE: The nest box was installed in January; destruction and removal of the CIRCLA Building occurred throughout the reproductive season and was not completed until later in the summer.

Lab Activities

Collected samples were prepared in the RMANWR lab and submitted for contaminant analysis following the reproductive season. Eggs were allowed to partially thaw at room temperature for approximately 30 – 45 minutes to allow removal of the shell. Egg content was transferred to certified-clean 2 oz. jars, labeled, chains of custody generated, and packaged for submission to the NWRC lab for contaminant analysis. Of the 47 eggs collected, 42 were kestrel eggs and 5 were European starling eggs collected fortuitously.

Activity	Refuge-wide	Core	Periphery
Nest boxes Available	37	12	25
Nests initiated	34	8	26
Single Clutch	29	8	21
Second Clutch	5	0	5
# Successful Nests (clutches with ≥ 1 fledgling)	11	4	7
Total # Eggs Laid	120	32	88
Average Clutch Size per Nest	3.5	2.7	3.5
Total # Hatchlings	43	14	29
Hatching Success (#nestlings/ # eggs)	35.8%	43.8%	32.9%
Total # Fledglings	35	13	22
Reproductive Success (clutches with ≥ 1 fledgling/ #clutches)	32.4%	50.0%	26.9%

Table B.1.a.5 FY 2010 American kestrel summary activity data, RMANWR.

Summary Contaminant Data Analysis

Of the 29 eggs submitted to NWRC for contaminant analysis, only three (2NW, 3NW, 35SE) exceeded the No-Observed Adverse Effects Concentration (NOAEC) of 0.5µg/g. Of those, two (2NW, 35SE) exceeded the Maximum Allowable Tissue Concentration (MATC) of 1.0 µg/g.

B.1.b. European Starling FY 2010

Sample Locations

The BMP identified 24 sites for placement of starling nest box arrays. These sites provided a representative number of arrays from each of the five Soil Remediation Types, described in the BMP as: None (No Remediation), Excavation (Priority 1 borrow area), Excavation and

backfilled remediation sites, Tilled TRER Sites, and Engineered caps and covers. An additional site (35A), located west of Building 111, was included due to USFWS interest when samples collected from this array in previous years continued to have measurable levels of organochlorine pesticides despite several local clean-up projects (excavation and backfill). This addition brings the total potential sites to be monitored to 25. An evaluation of the suitability of these 25 sites for placement of nest boxes for the FY 2007- 2010 field seasons included identifying areas of current construction and restoration activities as these activities can negatively affect habitat in the starling's foraging area.

In addition, an evaluation of the habitat within the estimated forage area was performed. Evaluation of nest box sites for suitable habitat is very important as starlings are omnivores and primarily feed insects to their young. Starlings are essentially grassland feeders and take invertebrates from foliage, the surface of the ground, and the upper few centimeters of the soil. During breeding season and while feeding young, their diet consists almost entirely of invertebrates obtained from the surface or from the upper few centimeters of the soil of grass fields. Sparse habitat in the feeding range around the nest box arrays may result in a lower density of invertebrates and an increase in forage area which in turn may adversely impact nest box occupancy and nest success.

Twenty-four of the 25 potential sites were monitored in FY 2010. The location and the remediation strategy in the foraging range for each nest box array is listed in Table B.1.b.1, and a description of each remediation strategy can be found in the BMP. Each nest box array contains ten boxes with the exception of site 35A which has eight boxes. The two cap and cover arrays, two Tilled Terrestrial Residual Ecological Risk (TRER) arrays, and three Priority 1 borrow area (excavation with no backfilling) arrays were not monitored in FY 2007, FY 2008 and FY 2009 because of remediation and restoration activities. In FY 2010, array 25CC (TRER) was the only one not monitored for the same reasons.

Site ID	Remediation Strategy	Site ID	Remediation Strategy
1NC	Caps and Covers	24SW	Excavation (Priority 1 Borrow Area)
1WC	TRER	25NE	No Remediation Activity
2SW	No Remediation Activity	26CC	Excavated and Backfilled
4NC	Excavated and Backfilled	26NW	TRER
4SW	TRER	26WC	Excavation (Priority 1 Borrow Area)
6NC	TRER	27	No Remediation Activity
6NW	Excavation (Priority 1 Borrow Area)	30SW	TRER
7	No Remediation Activity	31SW	Excavation (Priority 1 Borrow Area)
20NW	No Remediation Activity	35A	Excavated and Backfilled
20SE	Excavated and Backfilled	35WC	TRER
23SC	Excavation (Priority 1 Borrow Area)	36NW	Excavated and Backfilled
24NC	Excavated and Backfilled	36SC	Caps and Covers

Table B.1.b.1. FY 2010 nest box arrays monitored in with remediation strategy for each array, RMANWR.

Nest Box Monitoring

An effort was made to monitor all nest boxes at least twice each week during the monitoring season. Information from each site was recorded on a nest box monitoring sheet, one of which was used for each monitoring date. Nest condition was rated 1-4 using the following criteria:

1 -no nesting material present
2 -some nesting material present but no nest cup formed
3 -partially formed nest cup present
4 -completely formed nest cup present

Other information recorded on the monitoring data sheet included the number of eggs present, number of chicks present, and the presence of any unhatched eggs or dead chicks. Abnormalities found during monitoring were recorded in the comments section of the nest box monitoring form. Results from nest visits and reproductive success endpoints derived from these data are summarized in the raw data files for this project. For further details on the procedures used for nest box monitoring and analysis of reproductive endpoints, refer to the *U.S. Fish and Wildlife Service Rocky Mountain Arsenal National Wildlife Refuge Fiscal Year 1994 Annual Progress Report,* Appendix A.

Sample Collection

Starling nestlings were collected as close to 15 days post-hatch as possible, allowing for maximum potential exposure. At day 21, fledging occurs, and the starling young are independent of their parents. Some variability occurred in the collection of chicks due to holidays, weekends and workload, but chicks were at least 15 days of age at time of collection. Nestlings were euthanized in a pre-charged CO_2 saturated chamber and given a unique identification number according to the site, nest box and date collected. Whole birds were frozen at -20^{o} C until ready for dissection. Brains were removed and stored in a chemically cleaned jar at -20^{o} C until they were transported for chemical analyses at the National Wildlife Research Center (NWRC) in Fort Collins, Colorado. Samples were tracked with chain of custody information submitted electronically through the Army laboratory and hard copies were delivered to NWRC with the samples.

Nesting Data

During FY 2010, all sites showed evidence of starling activity with various stages of nest building observed in most boxes (Table B.1.b.2). Individual nest boxes can be occupied for up to two complete cycles of nesting during the starlings' reproductive season (March-July). Occupation of nest boxes varied between the different sites and ranged from 9 to 19 nests initiated per site. This range is slightly higher than the FY 2007-2009 which had a range of 8-18 nests per site.

Site ID	Nests Initiated	Nests w/at Least One 15-day-old Chick	% Nests Initiated w/at Least One 15-day-old Chick
1NC	7	4	57.1
1WC	13	4	30.8
2SW	10	6	60.0
4NC	17	12	70.6
4SW	19	12	63.2
6NC	12	8	66.7
6NW	16	11	68.8
7	17	12	70.6
20NW	17	12	70.6
20SE	15	10	66.7
23SC	2	1	50.0
24NC	15	13	86.7
24SW	6	2	33.3
25NE	16	12	75.0
26CC	19	15	78.9
26NW	4	2	50.0
26WC	9	5	55.6
27	18	9	50.0
30SW	12	9	75.0
31SW	16	15	93.8
35A	9	9	100.0
35WC	13	9	69.2
36NW	17	11	64.7
36SC	4	2	50.0
Totals	303	205	67.7

Table B.1.b.2. FY 2010 nesting activity in monitored arrays, RMANWR.

Summary Contaminant Data Analysis

Two hundred and four samples were submitted to the NWRC. The target sample weight for a method detection limit of 0.05 µg/g is 1 gram. If a sample weight was less than 1.0 gram, the sample was analyzed with a resulting Detection Limit (DL) greater than 0.05 µg/g. The detection limit varies according to the sample weight with an increasing detection limit associated with a decreasing sample weight. One hundred and ninety-five of the 204 samples had weights that were equal to or greater than 1 gram. Sample weights were variable as brain weight is dependent on the size of the nestling. Forty-two sample results were over the contracted Method Detection Limit (MDL) of 0.05 µg/g. No sample results were equal to or greater than the MATC value of 1.0 µg/g.

B.1.c. Fortuitous Collections

Since 1993, the Service has been investigating causes of mortality in fortuitous specimens. Causes of death include dieldrin poisoning, electrocution and trauma.

During FY 2010, the collection of dead or dying wildlife continued throughout the Refuge. There was no organized or routine search for dead or dying wildlife, rather an effort to collect specimens reported by workers and visitors on site. The Service continued to follow the 1994 fortuitous specimen protocol for handling dead animals. The National Wildlife Health Center (NWHC) provided necropsy support. Refuge biologists recognize typical signs of dieldrin poisoning, including posture at death, emaciation, and convulsions; therefore, not all specimens were submitted for necropsy. Additionally, samples may be too deteriorated for appropriate sample collection. When possible, Refuge biologists removed brains or livers from birds in which poisoning was suspected, and submitted them to Army contract laboratories for organochlorine pesticide analyses.

Brain tissue is used to determine whether lethal poison concentrations exist. The criterion developed by the Service for assigning cause of death as dieldrin poisoning is a concentration greater than nine parts per million (ppm) in the brain, or greater than four ppm in the brain with supporting necropsy (emaciation, no other lesions). Endrin is considered to be lethal at 0.8 ppm in the brain, however liver tissue may have some diagnostic value and can be useful when brain tissue is not available because of scavenging, decomposition, etc. In 1996 analytical data from tissues of raptors and songbirds tentatively diagnosed with dieldrin poisoning showed a high correlation between brain and liver residue concentrations for raptors, but not for songbirds.

During FY 2010, fortuitous specimens were collected from 26 species at Rocky Mountain Arsenal National Wildlife Refuge with a total of 54 samples collected overall. Black-tailed prairie dogs and mourning doves (*Zenaida macroura*) were the most numerous with eight specimens each, followed by European starlings with six. All other species had 1-3 specimens collected. Of those collected, 24 were dissected and sent to the lab with four European starling and eight mourning dove samples being the most numerous, and all other species having 1-2 samples sent to the lab. Five black-tailed prairie dogs were submitted for Visitor Center display mounting and 3 other specimens (one sora (*Porzana carolina*), one black-tailed prairie dog, and one black-headed grosbeak (*Pheucticus melanocephalus*)) were identified as potential Visitor Center display mounts. One mule deer (*Odocoileus hemionus*) was disposed of and 21 specimens remain of the original 54 collected.

Species	# of Individuals	No Sample	Possible VC Mount	Disposed	Submitted for VC Mount	# Sent to lab	# Remaining
American Kestrel	1					0	1
Northern Shoveler	2					2	0
House Finch	3					2	1
European Starling	6					4	2
Meadow Vole	1	1				0	0
Mule Deer	2			1		0	1
Mountain Bluebird	1					1	0
Sora	1		1			0	1
American Robin	3					1	2
Black-tailed Prairie Dog	8		1		5	0	3
Black-headed Grosbeak	1		1			0	1
Gadwall	1					1	0
American Bison	2					0	2
Horned Lark	1					1	0
White-tailed Deer	2					0	2
Lark Bunting	2	2				0	0
Mourning Dove	8					8	0
Western Meadowlark	1					1	0
Killdeer	1					0	1
Swainson's Hawk	1					1	0
Common NightHawk	1					0	1
Vesper Sparrow	1					1	0
Red-tailed Hawk	1					1	0
Eastern Fox Squirrel	1					0	1
Western Kingbird	1					0	1
Coyote	1					0	1
Total	**54**	**3**	**3**	**1**	**5**	**24**	**21**
Number of Species	26				**Number of Species**	12	15

Table B.1.c.1. Summary of FY 2010 Fortuitous Specimens, RMANWR.

Residue Data

Of the 54 fortuitous specimens collected, 24, representing 12 of the 26 species collected, were sent to the lab for testing. Of all specimens, 3 European starling samples (10FES008, 10FES020, 10FES049) exceeded the Target Detection Limit (TDL), though none exceeded the Maximum Allowable Total Concentration (MATC) and none exceeded the TDL or MATC with the Fish and Wildlife Service correction factor applied. Samples 10FES008 and 10FES049 were found in 26CC while 10FES020 was found in 35SC. The three samples over MDL (0.005 µg/g) did not exceed MATC (1.0 µg/g).

						FWS Concentration		
site_id	test_name	samp_date	corrected _value	Exceed Target DL (0.05ug/g)	Exceed MATC (1.0ug/g)	FWS Conc Value	Exceed Target DL (0.05ug/g)	Exceed MATC (1.0ug/g)
10FES008	DLDRN	3/31/2010	0.807	EXCEEDS	FALSE	0.87963	EXCEEDS	FALSE
10FES020	DLDRN	6/21/2010	0.111	EXCEEDS	FALSE	0.12099	EXCEEDS	FALSE
10FES049	DLDRN	6/25/2010	0.199	EXCEEDS	FALSE	0.21691	EXCEEDS	FALSE

Table B.1.c.2. Summary of FY 2010 residue data, RMANWR.

B.2. Management of Black-tailed Prairie Dog Populations

Black-tailed prairie dog management was a priority in FY 2010. Prairie dogs are becoming more widespread with an estimated 3,863 acres of colonies; they were edging closer to and on top of sensitive Army-retained lands, and becoming established within habitat restoration areas. Management efforts during FY 2010 were focused mainly on protecting Army areas from town expansion, especially the Integrated Cover System (ICS) and the Enhanced Landfill (ELF). Trapping and relocation efforts successfully prevented significant encroachment into those areas. Besides Army land protection, certain habitat restoration zones have been thinned of prairie dogs, including the near complete removal of a colony surrounding the new visitor center project. This trapping season has resulted in an all-time high of 1,008 individuals captured and relocated. The following sections outline the FY 2010 trapping and relocation effort, while illustrating the spread of prairie dogs within the boundaries of the RMANWR.

B.2.a. Population and Health Surveys

As in previous years, colony surveys were conducted on all-terrain vehicles (ATV). The surveys took place between August and December of 2010. A Trimble Geo XH GPS unit was attached to an Arctic Cat ATV, and the perimeters of every RMA prairie dog colony were spatially defined.

No plague events were detected in 2010, and based on a brief external examination of those captured, prairie dogs appeared in good health at RMA. No other prairie dog surveys were conducted in 2010.

B.2.b. Relocation and Colony Control Efforts

A new system of data collection using a GIS database was implemented in FY 2010. Each trapping zone was given a "Field ID" number, and captured prairie dogs were recorded and logged by their respective ID in order to create a geographic model of the year in trapping. A total of 1,008 individuals were captured and relocated to the northwest part of the refuge. Trapping includes the use of a live trap baited with three-way livestock feed. Efforts this year were focused on protection of Army-retained land with the current objective being to reduce the density in areas that are adjacent to these sensitive zones (Figure B.2b.1). Prairie dogs appeared briefly on the ICS cover (FID 331) and the ELF (FID 328) this year, but were immediately flushed out of their burrows and relocated. On the ELF, two individuals were removed from just within the fence, and were assigned the ID number 328, providing the coordinates of the adjacent colony.

The technique of "flushing" has been used for a number of years at RMA with much success. In flushing, a mixture of Dawn dishwashing soap (non-toxic to prairie dogs) and water is pumped

into a burrow using a hydro-mulcher[1]. As a prairie dog emerges, it is grabbed, placed in a trap and relocated. The flushing technique accounts for 158 of the 1,008 relocations. Figure B.2.b.2 on page 28 demonstrates the prairie dog capture effort through the year. All captured prairie dogs were placed throughout Section 22. New relocation zones have now been established in Sections 32 and 12 for use in FY 2011.

B.2.c. Future Issues and Concerns

Black-tailed prairie dog acreage continues to increase yearly and, with the absence of plague outbreaks in the last 10 years, coverage is at its highest level since FY 2000. Current acreage is at 3,863 acres - a net increase of approximately 820 acres. This is 1,363 acres over the recommended 2,500-acre maximum established in the draft Habitat Management Plan. This year saw expansion into 1,084 new acres of habitat, while 255 acres of colonies retreated (Figure B.2b.1). Retreat is mostly due to natural migration, but also mechanical operations in the area, especially northern Section 24. Expansion appears to correlate well with the maintenance of certain habitat restoration areas. For example, in Section 19, Project F27C has 28.5 acres of prairie dog burrows within the 79.5-acre project area. This project will be an area of focus during the FY 2011 trapping year. Another example is in Section 20; Project F41 has seen a massive influx of prairie dogs, with approximately 58 acres of new colony established.

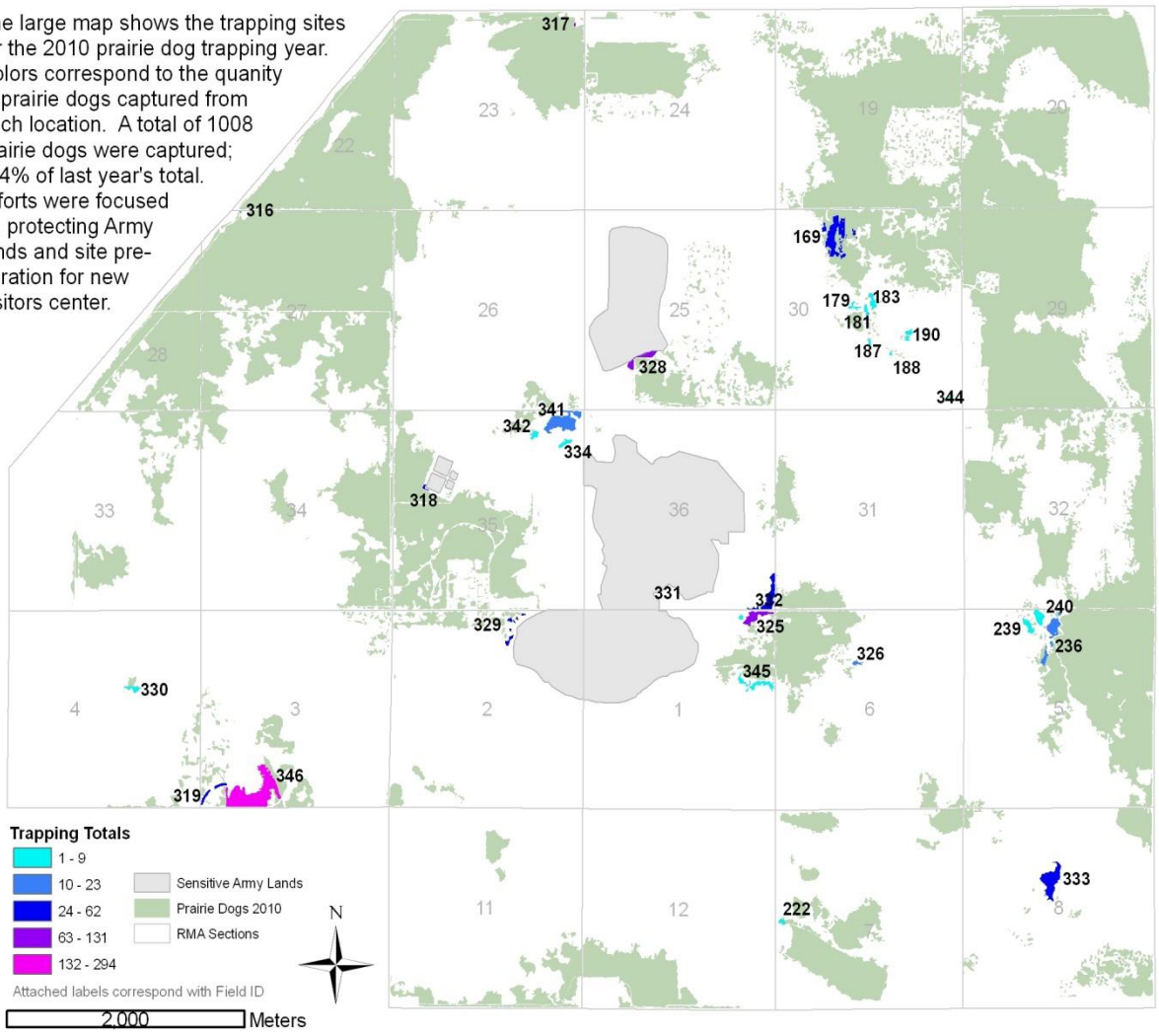
An area where colony expansion may be of special concern is within the bison pasture. Figure B.2.b.2 shows the expansion rates since the last plague event in 2005 and illustrates the rate at which expansion has been occurring, both throughout the refuge and within the bison pasture. The fastest rates of spread appear to occur in the northeast section of the pasture.

[1] A hydro-mulcher is a piece of agricultural equipment used to disperse mulch materials, mixed with water, through a cannon or hose.

2010 Prairie Dog Trapping Summary

Map 1

The large map shows the trapping sites for the 2010 prairie dog trapping year. Colors correspond to the quanity of prairie dogs captured from each location. A total of 1008 prairie dogs were captured; 114% of last year's total. Efforts were focused on protecting Army lands and site preparation for new visitors center.



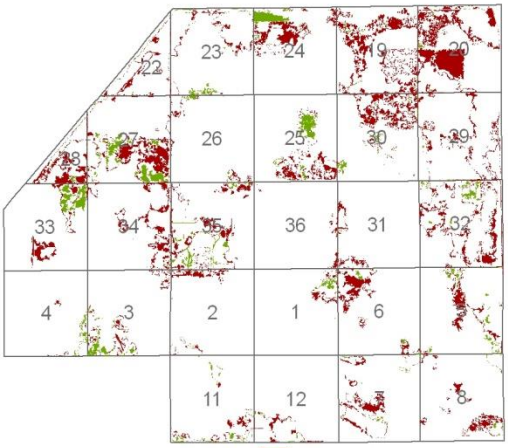
RMANWR 2010 Trapping Totals and Locations

Section	Field ID	Adult M	Adult F	Juv M	Juv F	Total
1	345	1	1	0	0	2
1	325	27	35	13	10	85
1	320	1	2	0	0	3
2	329	10	17	0	1	28
3	346	101	122	34	37	294
3	319	11	14	1	1	27
4	330	3	2	0	0	5
5	240	2	7	0	0	9
5	239	1	1	0	0	2
5	238	2	2	0	0	4
5	236	9	8	0	0	17
6	326	7	13	0	0	20
7	222	2	2	0	0	4
8	333	22	31	1	2	56
23	317	52	59	11	9	131
25	328	20	25	13	14	72
27	316	8	6	2	3	19
30	344	0	0	1	1	2
30	191	3	2	1	0	6
30	190	1	1	0	1	3
30	188	1	1	4	3	9
30	187	3	2	0	1	6
30	186	7	8	1	5	21
30	183	2	1	0	0	3
30	181	4	1	0	0	5
30	180	5	6	1	0	12
30	179	1	0	0	0	1
30	169	24	38	0	0	62
35	342	1	1	0	0	2
35	341	16	7	0	0	23
35	334	1	1	1	3	6
35	318	16	12	2	2	32
36	332	19	13	0	1	33
36	331	2	2	0	0	4
		Total Prairie Dogs				1008

Trap Site 2010 Coordinates and Acres

SECTION	Field ID	Acres	X	Y
1	345	2.43	2188349.15253	178671.38931
1	325	2.83	2188318.54301	180438.91931
1	320	0.27	2187933.58897	180422.80607
2	329	0.09	2181926.00308	180462.99997
3	346	16.57	2174513.23529	175714.27423
3	319	1.18	2173369.64087	175742.61020
4	330	0.82	2171179.40972	178444.91954
5	240	1.64	2196157.88366	180476.36093
5	239	1.26	2195866.54444	180236.69886
5	238	0.03	2196213.22249	179949.13906
5	236	4.10	2196505.85173	180024.78732
6	326	0.44	2191133.98962	179234.89220
7	222	0.42	2189116.82920	172391.20439
8	333	6.12	2196531.04004	173515.82037
23	317	0.09	2183260.18907	196046.46257
25	328	2.34	2185140.13385	187243.84284
27	316	0.03	2174058.88980	191051.88207
30	344	0.19	2193670.06866	186263.44645
30	191	0.30	2192476.88829	187810.81270
30	190	0.44	2192535.45059	187971.38633
30	188	0.13	2192029.08103	187404.77058
30	187	0.29	2191432.12430	187699.41672
30	186	0.22	2191346.40584	188298.42113
30	183	1.16	2191515.20010	188781.06607
30	181	0.45	2191337.18169	188559.74747
30	180	0.08	2191399.57390	188481.31261
30	179	0.48	2190997.74964	188647.58411
30	169	7.98	2190485.98111	190512.84686
35	342	0.70	2182211.04696	185211.34806
35	341	7.41	2182988.82360	185557.43443
35	334	0.81	2183061.42200	184993.86985
35	334	0.04	2183056.96143	185095.37515
35	318	0.23	2179192.16023	183802.23469
36	332	3.92	2188710.43790	180995.72266
36	331	0.02	2185933.88815	181046.65577

X and Y coordinates: NAD_1927_StatePlane_Colorado_North_FIPS_0501



Prairie dog acreage increased sitewide by 1084 acres. There was, however, a 255 acre loss of prairie dogs. This loss is most likely attributed to new restoration work (tilling, disking, etc..) and natural migration. The increase in prairie dogs, however, also appear to correlate with restoration areas, but ones of ongoing habitat restoration work (mowing, seeding, etc...)

Figure B.2b.1. FY 2010 Prairie Dog Management Areas and Trapping Information, RMANWR.

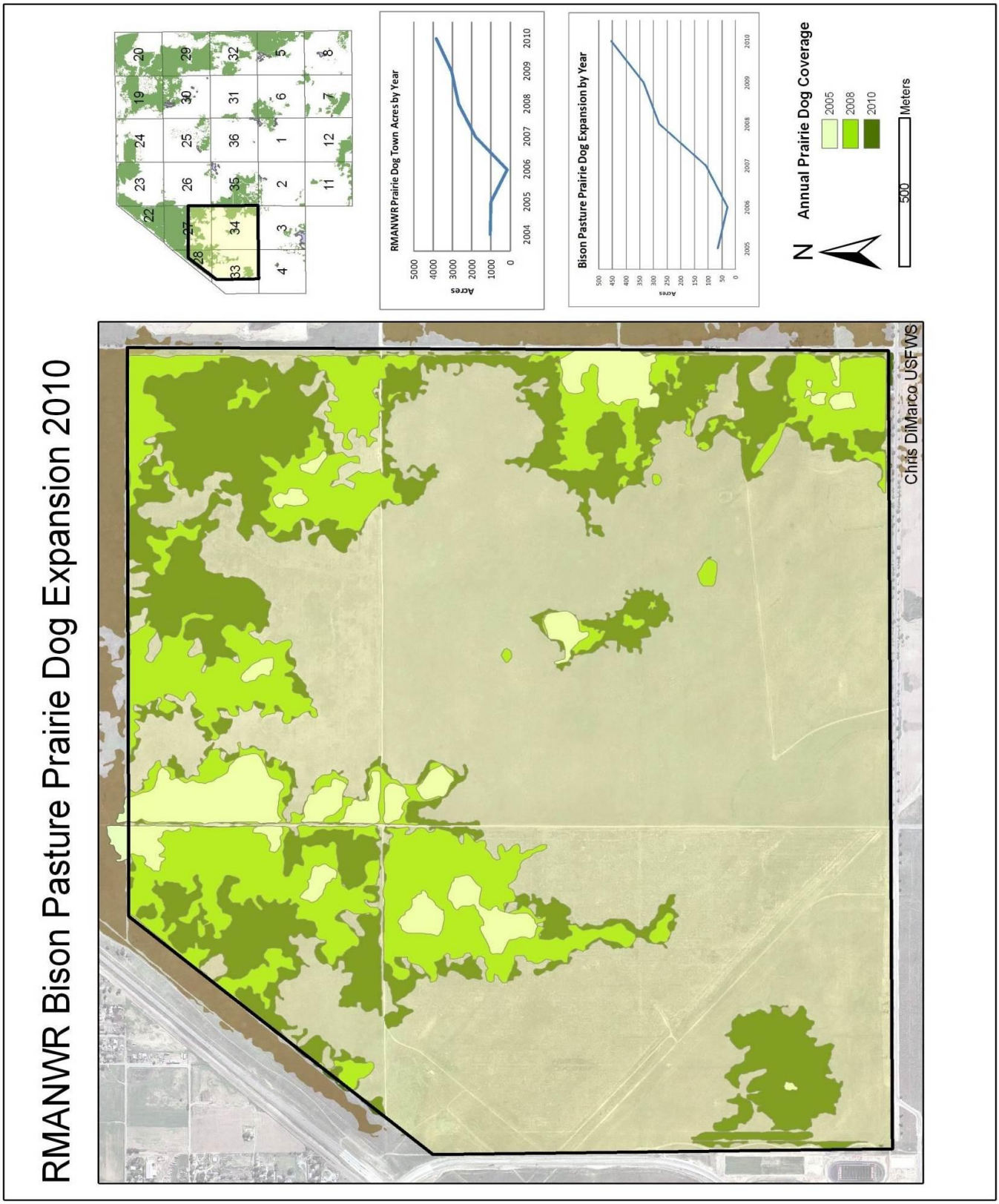


Figure B.2b.2. FY 2010 Prairie Dog Locations within the bison pasture, RMANWR.

B.3. Monitoring and Surveying of Aquatic Biota to Meet ROD Requirements Related to Aquatic Ecosystems and the ROD-based Lake Level Management Plan

B.3.a. FY 2010 Winter Waterfowl Survey

Introduction

The primary ecological function of Lower Derby Lake, for the duration of the surface remedy, is to provide waterfowl habitat. Seasonal drawdowns of Lower Derby Lake during the spring and summer months promote the growth of aquatic and wetland vegetation and stimulate populations of aquatic and terrestrial invertebrates at the lake's edge that provide the plant and animal food base required by waterfowl during the migration and wintering periods. A minimum of 50,000 migratory waterfowl annual use-days during the period of October - April, is required by the water protection plan. Target species include but are not limited to: Canada goose (*Branta canadensis*), wood duck (*Aix sponsa*), gadwall (*Anas strepera*), American widgeon (*Anas americana*), mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), cinnamon teal (Anas cyanoptera), Northern shoveler (*Anas clypeata*), Northern pintail (*Anas acuta*), green-winged teal(*Anas carolinensis*), canvasback (*Aythya valisineria*), redhead (*Aythya americana*), ring-necked duck (*Aythya collaris*), greater scaup (*Aythya marila*), lesser scaup (*Aythya affinis*), common goldeneye (*Bucephala clangula*), bufflehead (*Bucephala albeola*), hooded merganser (*Lophodytes cucullatus*), common merganser (*Mergus merganser*), red-breasted merganser (*Mergus serrator*), and ruddy duck (*Oxyura jamaicensis*).

Methods

Rocky Mountain Arsenal NWR provides waterfowl with year-round habitat, but its greatest use occurs during fall and spring migrations and winter months. Waterfowl surveys were conducted from mid-October to mid-April to monitor relative abundance, diversity and distribution. Surveys were conducted at Lake Mary, Lake Ladora, Lower Derby Lake, Parkfield Wetland, and Havana Pond for the state mid-winter survey conducted in late November. First Creek and the wetland complex are no longer surveyed. Surveys are conducted biweekly averaging two surveys each month. Surveys begin two hours following official sunrise and counts are recorded from standard observation points. A spotting scope and binoculars are used to view and count waterfowl. Observation points at survey sites were chosen to maximize visibility of the lake area. Only targeted waterfowl use of Lower Derby from September 2009 through April 2010 is presented in this report.

Results

Winter waterfowl surveys conducted on Lower Derby began on September 26 to capture the initial fall migration of teal species and lasted through April 15. Weather conditions permitted access to the lake and available open water. The lake was never entirely frozen during the survey which resulted in the waterfowl use days of target species on Lower Derby to exceed the plan's required 50,000 use-days by mid-December (Figure B.3.a.1). This contrasts sharply with last year's results when targeted use days were not met until late March. The mean number of

waterfowl counted per survey was 1,035. The peak total waterfowl count (n=5740) occurred on January 5 and was 98% Canada geese (Table B.3.a.1, Figure B.3.a.2). Canada geese also accounted for 74% of all waterfowl counted throughout the survey period. These results were similar to the 2008 survey period when Canada geese accounted for 77% of all individuals. The second and third highest use days were recorded for Northern shovelers and lesser scaup. The mean number of species was ten with peak diversity (15 out of 21 targeted species) occurring on March 1. Target species not observed on Lower Derby Lake during surveys were wood duck, cinnamon teal, greater scaup and red-breasted merganser.

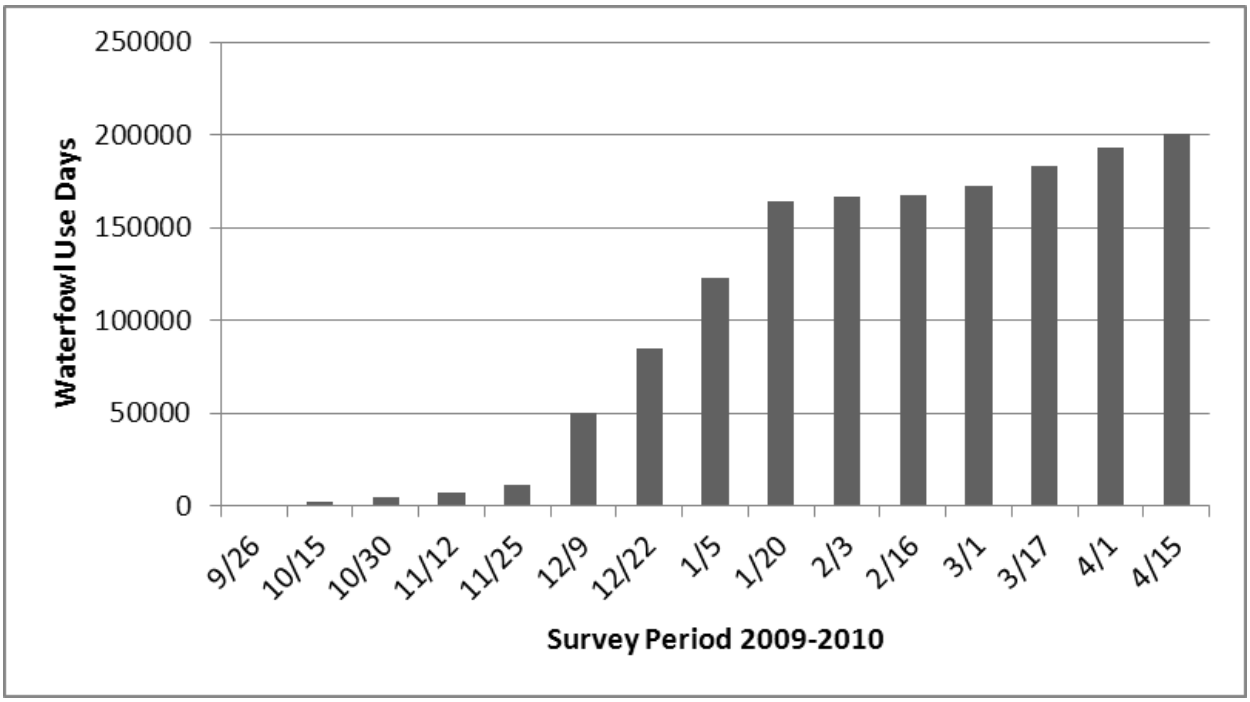


Figure B.3.a.1. Cumulative waterfowl use days on Lower Derby Lake from September 2009 to April 2010, RMANWR.

WATERFOWL SPECIES	SURVEY COUNT DATES															Total by species	USE DAYS
	9/26	10/15	10/30	11/12	11/25	12/9	12/22	1/5	1/20	2/3	2/16	3/1	3/17	4/1	4/15		
Canada Goose	7	0	0	150	147	1530	2	5625	1	4	7	1	1	2	2	**7479**	99001
Cackling Goose	0	0	0	0	75	4000	0	0	0	0	0	0	0	0	0	**4075**	50938
Wood Duck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0
Gadwall	20	36	35	8	5	0	0	6	3	0	1	21	30	61	64	**290**	3460
American Widgeon	28	1	0	0	0	0	3	0	0	0	0	10	0	0	0	**42**	441
Mallard	4	1	2	20	0	0	10	5	18	29	0	2	0	2	4	**97**	1173
Blue-winged Teal	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	18
Cinnamon Teal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0
Northern Shoveler	0	0	0	0	0	0	53	42	93	5	51	426	488	301	45	**1504**	20294
Northern Pintail	0	0	0	0	0	0	3	0	0	0	0	10	0	0	0	**13**	173
Green-winged Teal	0	0	0	0	5	0	6	4	16	0	5	19	10	6	3	**74**	962
Canvasback	0	0	8	13	29	0	0	25	32	45	12	33	5	2	3	**207**	2625
Redhead	12	27	2	5	23	0	39	0	2	2	1	87	61	27	2	**290**	3900
Ring-necked Duck	0	5	15	35	40	0	26	11	2	7	1	9	7	0	0	**158**	2014
Lesser Scaup	0	2	43	37	52	0	19	10	8	0	5	24	101	197	83	**581**	7209
Common Goldeneye	0	0	0	0	4	0	17	10	2	16	10	16	33	11	0	**119**	1579
Bufflehead	0	21	14	22	17	0	2	0	2	3	2	6	17	43	34	**183**	2235
Hooded Merganser	0	0	0	0	0	0	7	0	4	3	1	3	0	0	0	**18**	228
Common Merganser	0	0	3	0	0	0	12	2	9	1	8	10	2	2	0	**49**	632
Ruddy Duck	60	39	48	2	4	0	0	0	0	0	0	0	0	37	160	**350**	3402
Total by survey	**133**	**132**	**170**	**292**	**401**	**5530**	**199**	**5740**	**192**	**115**	**104**	**677**	**755**	**691**	**400**	***15531***	200284
Total species by survey	7	8	9	9	11	2	13	8	13	10	12	15	10	12	10		

Table B.3.a.1. FY 2010 Waterfowl count raw data throughout the survey season, RMANWR.

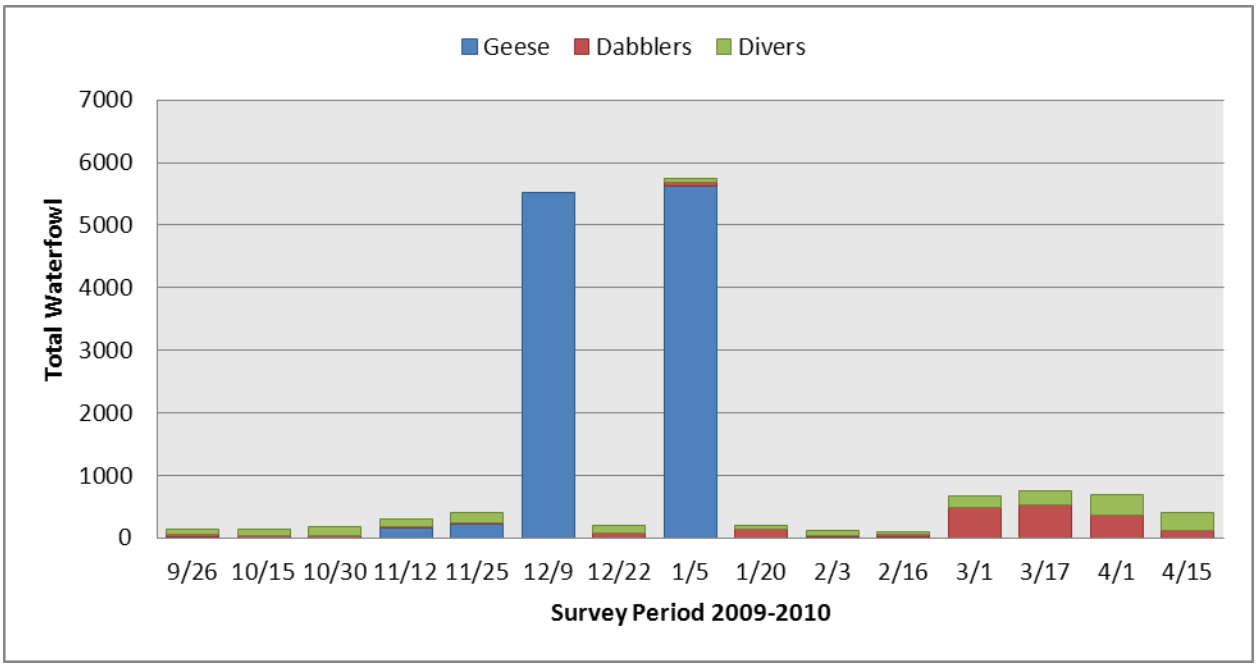


Figure B.3.a.2. Comparative use of Lower Derby Lake by two types of ducks and geese from September 2009 to April 2010, RMANWR.

B.3.b Fisheries Resources

In previous accomplishment reports, this section was presented as an appendix, the "Lake Level Management Report", which was produced through 2007. The RMA step-down fisheries management plan prepared in 2005, proposed long term monitoring (2006-2011), including annual fish surveys (electroshocking, gillnetting, and creel surveys), water quality testing (standard water tests and invertebrate sampling) and maintenance (water control structures and boats). Since then, decreasing availability of Service staff to assist with aquatic ecosystem management resulted in a reduction in monitoring efforts. Table B.3.b.1 lists the management actions for each lake accomplished in FY 2010.

Management Action	Lake			Comments
	Mary	***Ladora***	***Lower Derby***	
Population Assessment				
Electrofishing	6/28-29			Assisted by CDOW
Gillnetting, Fyke nets & minnow traps	6/22-23			
Stocking				
Bluegill	2000	43404	45004	Total fish stocked of various sizes on 4/23, 6/11 and 8/18 for $10, 910.
Fathead minnow	2000	23000	25000	
Channel catfish			700	
Removal/relocate				
Largemouth bass		57		Total fish removed from drainage trough and placed in lake on 11/9-10 and 12/13-14
Green sunfish		31		
Bluegill		7		

Table B.3.b.1. Aquatic sampling and stocking in refuge lakes in FY 2010, RMANWR.

B.4. Monitoring of Wildlife Populations Impacted by Cleanup Projects

The objectives of Service wildlife population monitoring on the Arsenal during FY 2010 were to maintain reproductive success of raptors and avoid impacts of restoration and cleanup activities on wildlife species by providing technical assistance to field personnel.

Subcontractor meetings were discontinued (last one on May 13), and replaced by weekly projected field activity requests through email communication with USFWS staff. Vegetation monitoring meetings were attended regularly to provide technical assistance on wildlife issues. Wildlife information ZIP bulletins were prepared and remaining field projects were reviewed by USFWS personnel for potential wildlife conflicts.

Birds of prey exhibit strong nest site fidelity, meaning they return to the same nest territory, so their presence in an area can be reliably predicted. Therefore, reduction of impacts on raptors involves ascertaining each species' arrival on site and the nesting chronology for each pair. Raptor nest monitoring begins in February with great horned owls (*Bubo virginianus*) and ends in September with the out-migration of Swainson's hawks (*Buteo swainsoni*), and burrowing owls. In FY 2010, eight great horned owl, 24 burrowing owl, 13 red-tailed hawk (*Buteo jamaicensis*), and 15 Swainson's hawk nests were monitored (see Figures B.4.1 and B.4.2).

Although a long-eared owl (*Asio otus*) winter roost of approximately nine birds was located in the locust thicket in northwest Section 31, no nests were found. An artificial structure consisting of a woven wood basket with a moss lining placed near the roost was not used in FY 2010.

No significant interactions occurred between contracted cleanup projects and raptors during the breeding season. In May, a burrowing owl nest in Section 23 along 9th was flagged with a buffer zone to reduce disturbance from activity in Borrow Area 4. During the fledging period, signs alerting motorists to wildlife in the roadway were placed near Swainson's hawk nests on C Street and 7th Avenue in August.

After raptors, other nesting bird species were the most frequently impacted by cleanup and restoration activities. Ground nesting birds that affected field operations included four pairs of killdeer (*Charadrius vociferus*) in May and June whose nests were found on a road shoulder in the ICS cover, at the new visitor center site and near solid set irrigation in Section 26; five pairs of American avocets (*Recurvirostra americana*) whose nests surrounded the western ponds in Section 26 where seed bed prep was being done; and a mourning dove nest with squabs in late July (Section 3) discovered during mowing. All nests were flagged and avoided. Bird nests found in equipment that required removal included American robins (*Turdus migratorius*) in vehicle wheel wells, house finches (*Haemorhous mexicanus*) in the air monitoring stations and European starlings in the irrigation booster pumps. Other noted bird encounters were three lark buntings (*Calamospiza melanocorys*) killed by hail near irrigation pipe in Section 19, a dead duck in Section 26 Project F22, a goose caught in fishing line and a live parakeet seen north of Building 112.

Incidents involving mammals varied, but were not numerous in FY10. Only one vehicle-deer death occurred and there were no fawn relocations. Mule deer were seen regularly using the ICS and HWL fenced areas and appeared to walk through gates rather than jump fences. Two raccoons each were electrocuted at the substation on two separate occasions, March 23 and August 14 (the latter causing a power outage). Three more were trapped and died in a dumpster in August. A dead coyote (*Canis latrans*) pup was discovered in a drainage canal at the HWL, and mouse nests were repeatedly removed from the tip bucket rain gauge in March at the met tower station. Two domestic dog trespasses were responded to in February: one inside the west gate and the second on the north perimeter in Section 24.

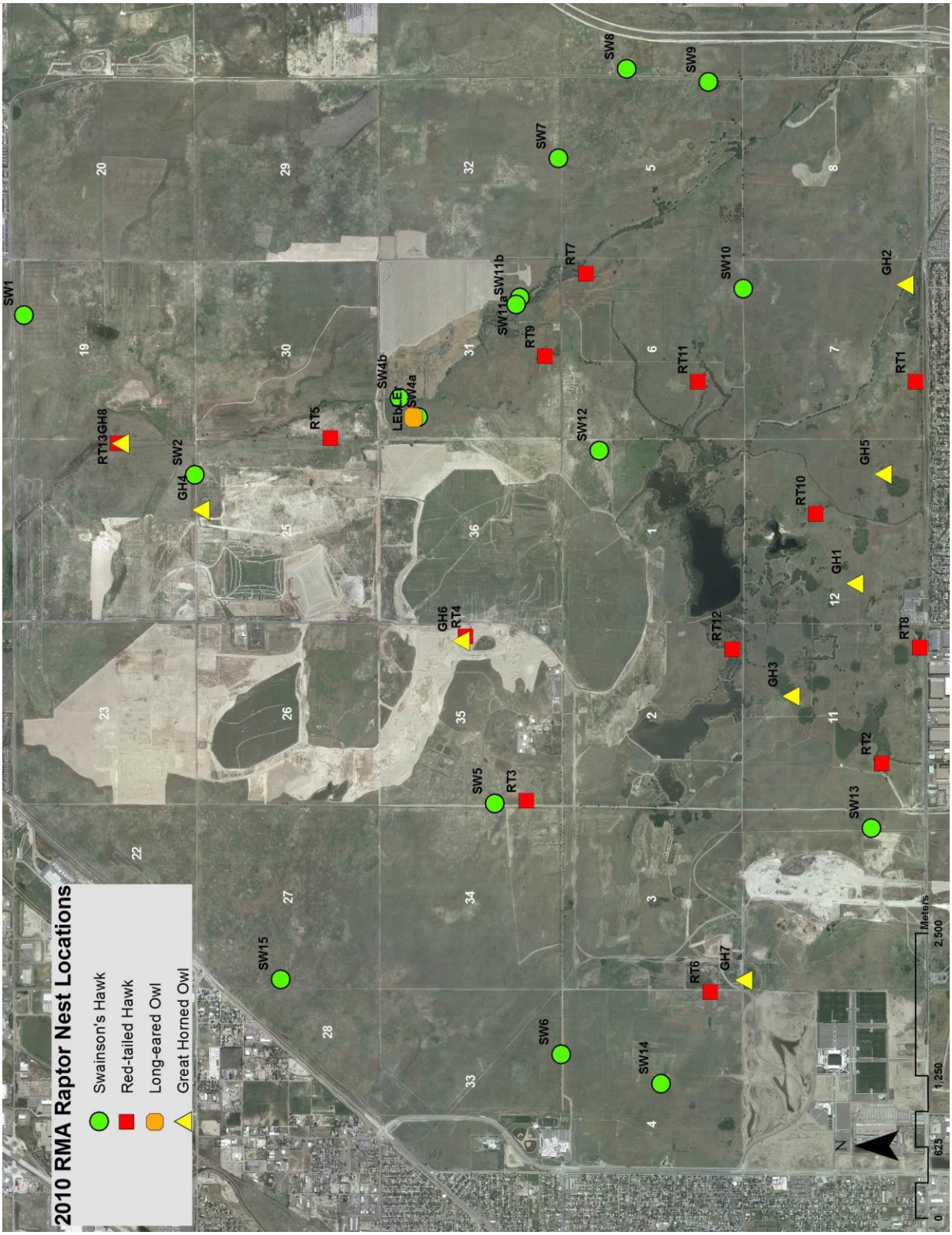


Figure B.4.1. Location of Raptor Nests in FY 2010, RMANWR.

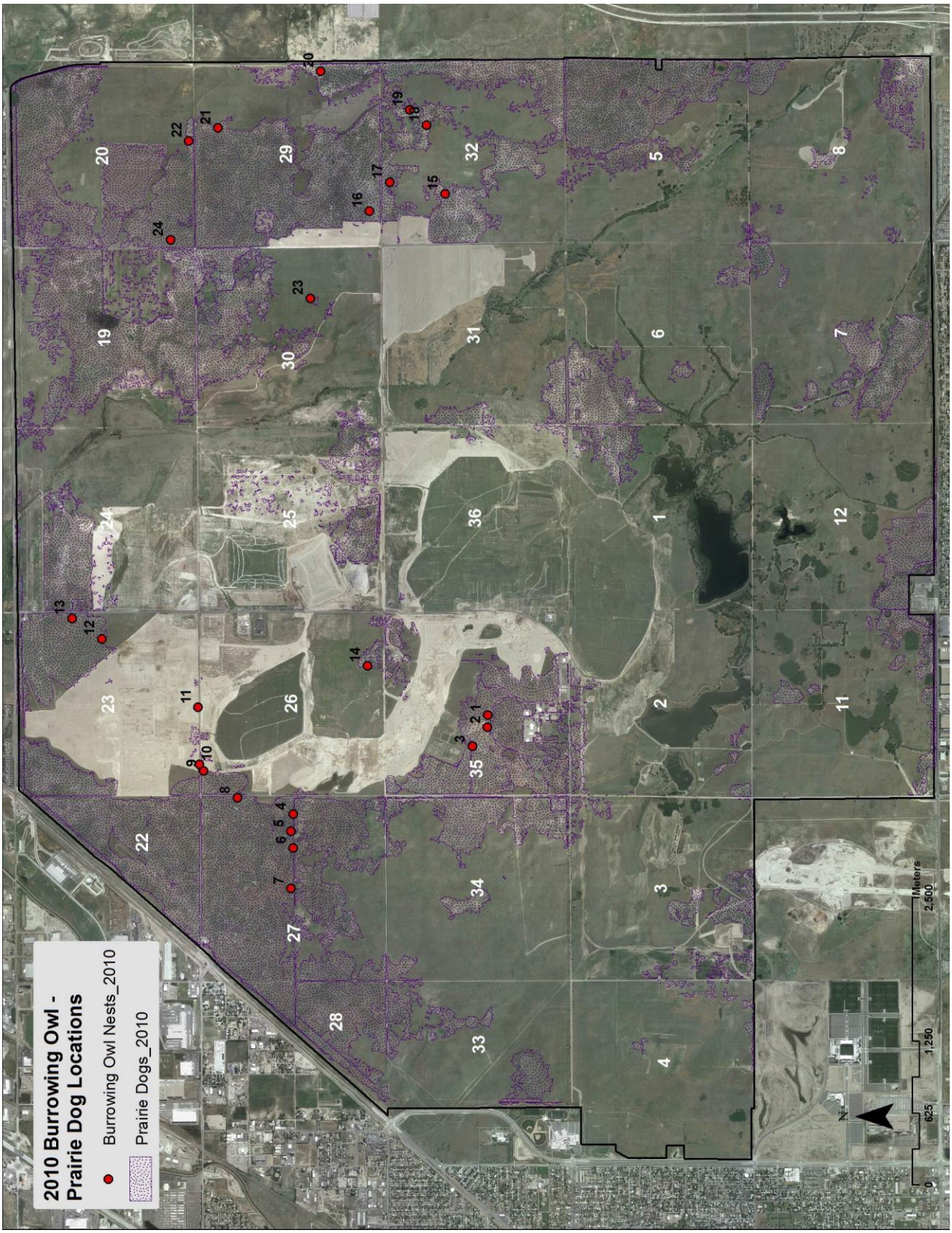


Figure B.4.2. Burrowing owl nest and prairie dog town locations in FY 2010, RMANWR.

B.5. Implementation of Bald Eagle Management Area Provisions to Ensure Protection of Federally Listed Species during Remediation Activities

B.5.a. Bald Eagle Roost Counts

Bald eagles have utilized parts of the Rocky Mountain Arsenal as a winter communal roost since at least 1986. The Bald Eagle Management Area (BEMA) was established by USFWS for the Army in the early 1990's to allow clean up to continue while minimizing disturbance to loafing, feeding and roosting eagles. In 2008, the boundaries of the BEMA were reduced to the winter roost itself in southeast Section 1 (Figure B.5.a.1). Eagle roosting was not affected, so the restricted area remained the same in FY 2010.

BEMA is implemented annually from October 15 to April 15. Roost counts from 1986 through 1999 were conducted every other night but were reduced to three times a week in 2000. Since 2002, roost counts have been done once a week in October and November and twice a week from December through April.

Specific single night roost count data from RMA are incorporated into two inclusive cooperative surveys, the Urban Denver Christmas bird count (January 1) and the Bald Eagle Midwinter Survey (the second Friday or Saturday of January). In FY 2010, the number of eagles recorded (31 and 26, respectively), was slightly greater than the number in FY 2009. The patterns of eagle use at the roost for these two specific count dates compared to the annual peaks for 1998-2010 are depicted in Figure B.5.a.2.

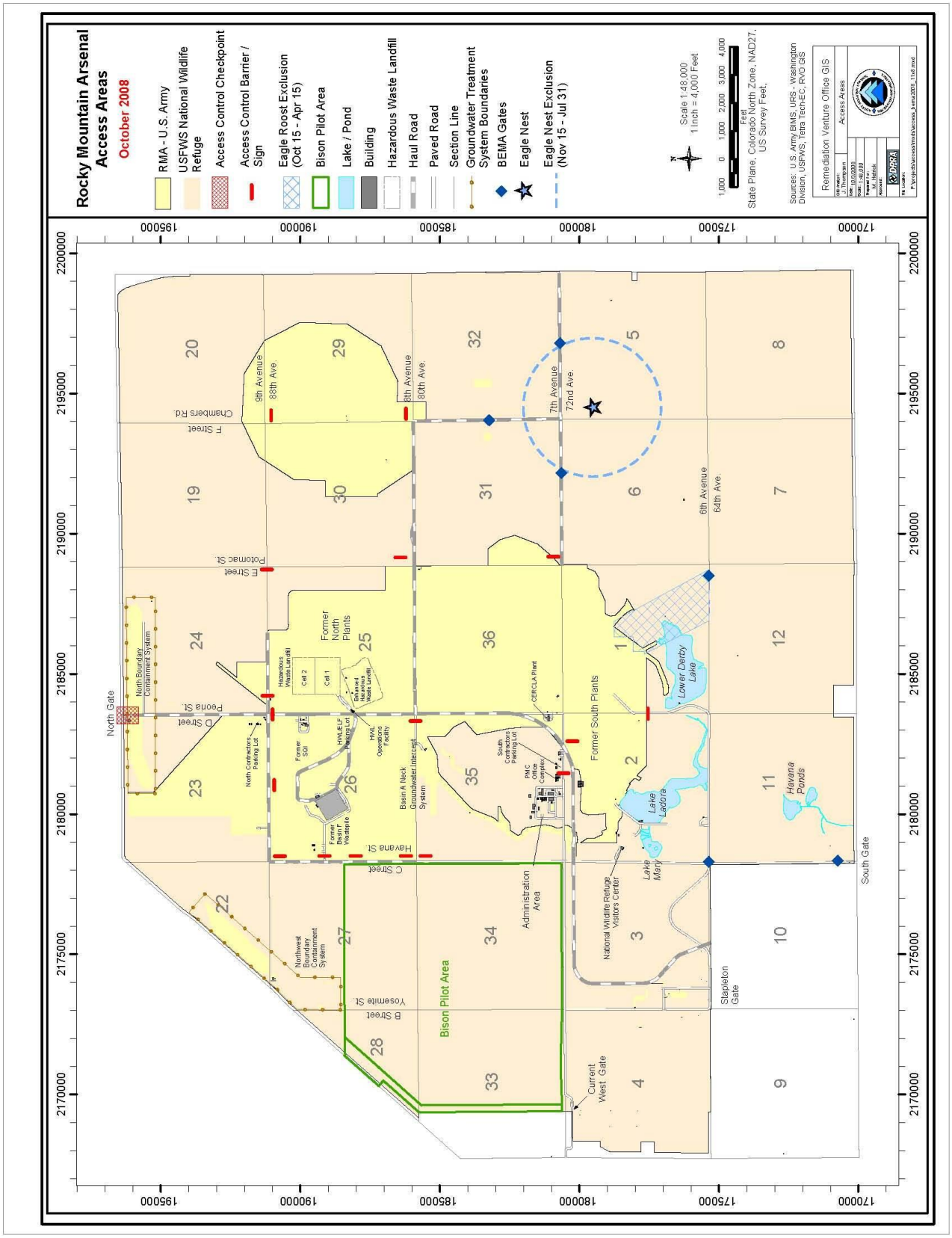


Figure B.5.a.1. Location of management zones for nesting and wintering bald eagles in 2009-2010, RMANWR.

The highest number of eagles observed on a single roost count occurred in 1998 with a progressive decline through 2003, followed by a small peak in 2005 and the lowest count occurring in 2008. The highest count of the FY 2010 season for a single night (31) occurred on January 1, with the second highest count (29) occurring twice on Jan 5 and February 12. The highest average roost occupation (26.75, n=4) occurred during the first half of February, with the second highest average (25.8, n=5) in the first half of January (figure B.5.a.3). Adults and sub adults were equally represented throughout the survey. No banded eagles were observed either at the roost or on the refuge. Roost count data was shared with state biologists conducting similar counts at other nearby roosts.

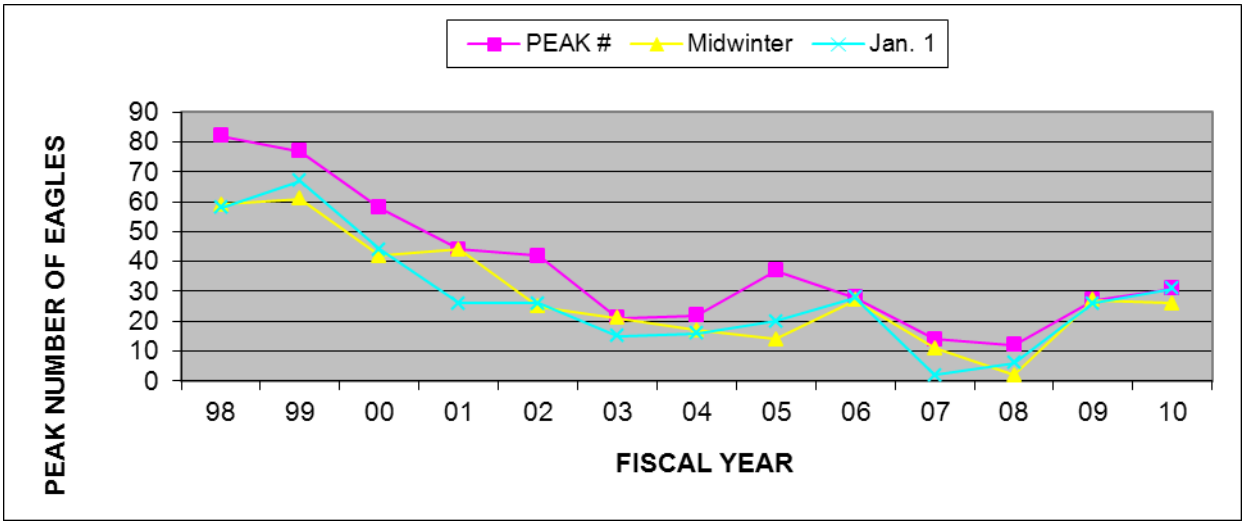


Figure B.5.a.2 Bald eagle roost counts on the Rocky Mountain Arsenal representing peak numbers and two counts in January, for the period, 1998-2010, RMANWR.

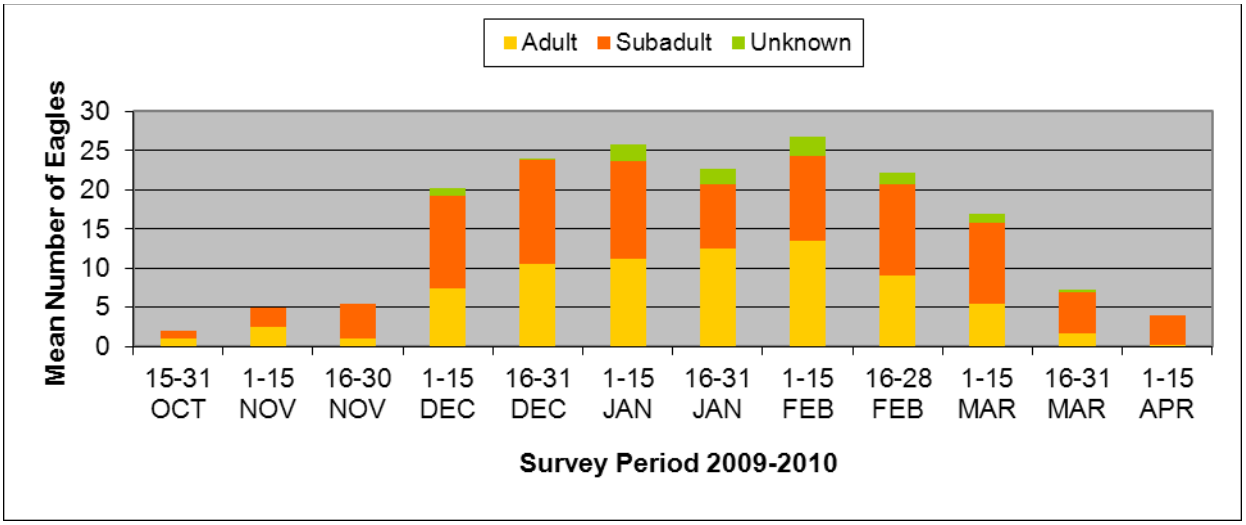


Figure B.5.a.3. Mean numbers of adult and sub adult bald eagles at the communal roost on the Rocky Mountain Arsenal NWR from October 2009 through April 2010, RMANWR.

B.5.b. Bald Eagle Nesting Activity

In addition to the protection provided to wintering bald eagles by BEMA, a second exclusion zone, the Bald Eagle Nest Area (BENA), established a half-mile buffer surrounding the Bald Eagle Nest Area located in northwest Section 5 (Figure B.5.a.1). Restricted access is enforced from November 15 through July 31, adhering to federal and state guidelines. In FY 2010, the adult pair fledged two eaglets. Nesting activity is summarized below.

The adult eagle pair periodically visited their nesting territory in November and December 2009. No other specific breeding behavior (e.g. carrying nest material, copulation) was observed until incubation began on February 24. On March 29, the posture of the setting adult indicated it was brooding at least one chick. On April 5, one chick was visible, and a second chick was seen on April 12. Both eaglets were branching by June 16 and had fledged by June 25.

The refuge eagle pair have successfully incubated fifteen eggs ($\bar{x}$ =1.6 per attempt) and fledged twelve eaglets ($\bar{x}$ =1.3) in nine years (Table B.5.b.1). Typically, a new pair will only lay one egg the first year (2002) and then produce two or possibly three thereafter. The pair appeared physically different in 2005, (no longer distinguishable by size) and also only appeared to hatch one egg. The reasons for the single hatch in 2008 is not apparent and was low compared to 5 out of 17 nests in the metro area having 3 chicks and 31 fledglings. In 2009, production was very poor in the metro area, but 2010 was average with only two nests having three eaglets and one reported failure of a new pair. Additionally, a June storm blew over the Barr Lake nest with the nestlings in it, but both successfully fledged from their ground nest.

Year	Nest Attention	Incubation Observed	Hatch Date	Hatch Total	Fledge Date	Fledge Total	Color Bands	Comments
2002	Unknown	Feb 23	Apr 6	1	Jun 24 – Jul 11	1		
2003	Unknown	Mar 3	Apr 7	2	Jul 2 – 7	1		Only 1 chick after May 10 storm
2004	Feb 9 – Feb 23	Feb 23	Mar 30	2	Jun 22	2	**Red** BM, BO	
2005	Jan 25 – Feb	Feb 19	Mar 27	1	Jun 20 – 27	1	**Red** CP	Found dead Jul 7
2006	Nov 2005 – Feb 13	Feb 15	Mar 20	2	Jun 15 – 26	2		
2007	Feb 9 – 14	Feb 20	Mar 27	2	Jun 18	1		Only 1 chick after Apr 24 storm
2008	Jan – Feb 19	Feb 21	Mar 28	1	Jun 12	1		
2009	Jan 15– Feb 18	Feb 19	Mar 30	2	Jun 24	1		Only 1 chick after Apr 21 storm
2010	Unknown	Feb 22	Mar 29	2	Jun	2		
TOTAL				**15**		**12**		

Table B.5.b.1 Summary information for the bald eagle nest, 2002 -2010, RMANWR.

B.5.c Administration of BEMA and BENA

The administration of BEMA was coordinated in several ways. A bulletin was posted on the Lotus Notes RMA Bulletin Board by the PMC. Regular updates were given at contractors' meetings, and activities that occurred either temporally or spatially in the BEMA were routed to Service biologists for approval. Once an activity had been approved, contractors made routine contact with BEMA personnel for physical access. In FY 2010, compliance with these regulations was excellent. Aerial photo flights were eliminated over the roost and nest sites from October 2009 through July 2010. Requests for activity during restricted time periods were limited to access to the roost road to open the water structures between Lower and Upper Derby because of spring run-off in the Uvalda Ditch.

B.6. Program Management and Supervision and Service Input to RMA Committee and Council

B.6.a. Remedy Coordination Activities

RMA Committee and Council Support

U.S. Army funding to the RMA Refuge in FY 2010 provided for a Remedy Coordinator (RC) senior staff position to coordinate ongoing RMA remedy and Refuge activities. A primary function of the RC was to provide Service and Refuge input as a member of the RMA Committee and to provide technical and policy support to the Refuge Manager in his role as a member of the RMA Council. During FY 2010, the Refuge RC participated in Pre-Committee Meetings with Remediation Venture Office (RVO) and Program Management Contractor (PMC) counterparts to prepare for monthly RMA Committee Meetings. The RC attended and provided Refuge-relevant input at all monthly RMA Committee Meetings and participated with the Refuge Manager in all RMA Council Meetings, including four combined Committee/Council Meetings during FY 2010.

In March of FY 2010, construction was set to begin on the Section 10 fences as well as the south gate setback to be completed by August of FY 2010. On June 17th, the Environmental Protection Agency (EPA) published the Notice of Intent to partially delete the surface media and structures for portions of the Central and Eastern Areas of the On-Post Operable Unit consisting of about 2,500 acres. The disposal report was completed on July 1st and public comments were received until August 26th. Deletion of all lands from the National Priorities List was to be completed by the Fall of FY10 when the transfer of the remaining lands was to go to the Rocky Mountain Arsenal as part of the refuge system bringing the total to 15,000 acres that will be managed by RMANWR staff.

RVO Support Activities

The Refuge RC provided technical and program management support to the RVO as a member of the RMA Management Team to help coordinate all ongoing activities at RMA. The RC also provided RVO support as the immediate supervisor for the Refuge Health and Safety Officer

who functioned as a member of the RVO Health and Safety Office (See section B.7, below). In addition, the RC participated with RVO senior managers as a member of the Award Fee Board (AFB) to evaluate the performance of the PMC in executing the RMA Remedy while protecting the RMA Refuge, during semi-annual appraisal periods. The RC attended and provided input at all AFB meetings in FY 2010, with emphasis on Award Fee Plan Category 8 for Refuge Protection.

Another RVO support function tasked to the RC was almost daily contact and communication with the PMC's Refuge Protection Coordinator and RVO and PMC Project Engineers to review and resolve ongoing remedy activities with potential adverse effects on wildlife and habitats, Refuge operations, Refuge visitors, or nearby communities in neighboring jurisdictions (e.g. Commerce City, DIA, Stapleton Development Corporation, City and County of Denver). A majority of these contacts in FY 2010 were related to completion of the Integrated Cover System (ICS), Basin F Cover System (BFCS), Hazardous Waste Landfill (HWL), Enhanced Landfill (ELF), and final grading and revegetation of Borrow Areas 3, 4, 5, and 10.

A significant, ongoing Remedy Support function assigned to the RC was coordinating and leading the RMA Surface Water Management Team (SWMT) (see section B.8.a). The RC helped charter the SWMT in FY 2000 and continued in FY 2010 to organize and chair monthly team meetings to plan and implement surface water management strategies and activities to assure an adequate water supply to meet Remedy and Refuge demands.

As in past years since FY 2002, the SWMT prepared, finalized and implemented the ***2009 RMA Surface Water Management Plan***. By executing this plan, the SWMT fully provided adequate water supplies to meet all Remedy water demands for dust control, compaction, and other construction needs plus irrigation water to support restoration of more than 700 acres of native short-grass prairie on caps and covers of the ICS, BFCS and HWL. In addition, the RC coordinated discussions between the RVO and Denver Water representatives on future (2011) plans by Denver Water to deliver Recycled Water to RMA under the Permanent Water provisions of the *2008 Nonpotable Water Lease Agreement for RMA.* The U.S. (Army and the Service) have a perpetual contract right with the Denver Water Board (DWB) for up to 700 acre feet of Recycled Water per year beginning October 2011 when Recycled Water delivery to RMA becomes available from a Denver Water main pipeline (Conduit 302) to be constructed along 56th Avenue. When Recycled Water becomes available to RMA, the availability of up to 800 acre-feet of Denver Treated Water (tapwater) for dechlorination and discharge into Lake Ladora is terminated under the 2008 Agreement.

The SWMT also provided coordination between the RVO and the PMC on operation of the Section 4 Groundwater Production Wells, the operation of inflows and outflows to and from the RMA lakes (Ladora, Lower Derby and Mary), and monthly water accounting reports to the Colorado State Engineer required by the Substitute Water Supply Plan for the Section 4 Wells. The SWMT also coordinated proper augmentation water delivery to the South Platte River to make up for depletions to the river caused by pumping tributary groundwater from the Section 4 Wells. In addition, the RC and members of the SWMT coordinated monthly reports to the Denver Water Billing Department on volumes of Denver Treated Water (potable water) used at

RMA for non-potable purposes, to assure accurate billing by Denver Water to the U.S. Army for Treated Water consumed at RMA as potable water.

One other RVO support function provided by the RC was RVO coordination on final transfer of administrative jurisdiction for the dams at RMA from the U.S. Army to the Service. During FY 2010, the RC updated a strategy approved by the Mountain and Prairie Region of the Service to defer transfer of Federal jurisdiction for the RMA dams from the Army until FY 2011. The RC also continued coordination with the Urban Drainage and Flood Control District (UDFCD) and the City and County of Denver (CCD) on their plans to rehabilitate the embankment of the Havana Ponds Dam. Jurisdiction for this dam was transferred to the Service by the Army in 2004. UDFCD and CCD have joint responsibility for perpetual maintenance of this dam to meet Colorado Safety of Existing Dams standards under provisions of a 2007 Inter-Governmental Agreement for Irondale Gulch Stormwater Management among UDFCD, CCD and the Service.

A final RC support function for the RVO was coordinating transition of RMA infrastructure currently owned and operated by the U.S. Army, to a "final" state RMA future with limited operation and maintenance funding. During FY 2010, this transition support focused on assisting the RVO and the PMC to flesh out details of an RMA Utilities and Infrastructure Improvement Plan (UIIP) tasked to the PMC in spring 2009. The UIIP addresses RMA utilities and related infrastructure including potable water, electrical distribution, sewerage, natural gas supply, communications and buildings and grounds. Draft alternatives for sewerage and electrical distribution were scoped out during FY 2009 and were completed in FY 2010.

B.7. Management RMA Health and Safety Program Support

B.7.a. RVO Health and Safety Office Participation

In FY 2010, U.S. Army funding to RMANWR continued to provide a full-time Refuge Safety Officer (RSO) position to participate as a partner in the RVO Health and Safety Office (HSO) with counterparts from the Army and Shell Oil Company (represented by URS). The HSO is a team tasked with leading and promoting a safety culture at RMA where safety is everyone's responsibility. The HSO team provided ongoing support in FY 2010 for the Occupational Safety and Health Administration's (OSHA) Voluntary Protection Program (VPP), Star status recognition of RMA safety programs of the U.S. Army, URS, and Tetra Tech EC, Inc. (PMC). Participation by the RSO in the HSO partnership contributed directly to the VPP achievements by RMA organizations in 2010 by increasing worker commitment to Zero Incident Performance.

As part of HSO responsibilities, the RSO participated in organizing and leading a number of activities including RVO Safety Steering Committee Meetings, RVO Management Team Safety Walks, RMA Safety Incident Review Committee Meetings, periodic RVO health and safety inspections of RMA facilities and operations, and HSO preparations for periodic RCRA inspections of RMA by the State of Colorado. The RSO, along with the Refuge Manager and the Remedy Coordinator, also participated in monthly subcontractor safety meetings sponsored by the PMC and in weekly RMA Management Team Meetings sponsored by the RVO Senior Management Group. Effective daily coordination and communication with HSO counterparts and safety professionals from other RMA organizations and with on-the-ground RMA project

personnel were instrumental to the RSO's effectiveness in promoting a site-wide safety culture at the Rocky Mountain Arsenal for FY 2010. The RSO also assisted HSO counterparts in preparing monthly and semi-annual safety performance evaluations of the PMC and related monthly and semi-annual reports for each Award Fee Appraisal Period in FY 2010.

B.7.b. Specific Safety Program Activities

To promote a safety culture among RMA Refuge staff, the RSO coordinated the distribution and periodic updates for health and safety information provided to Refuge staff electronically (via email) or with hardcopy, as well as health and safety information posted on Refuge bulletin boards. The RSO also assisted Refuge supervisors and Refuge staff in updating Job Hazard Analyses (JHA's) for common and recurring jobs or tasks performed by Refuge personnel, including JHA's for construction of a new bison corral. All JHA's were consistent with the format and content requirements contained in the Service Manual. JHA's provide an important basis for job hazard review during Tailgate Safety Meetings required at the beginning of each work day for all Refuge activities and operations. The RSO participated in numerous PMC and Refuge Tailgate Safety Meetings during FY 2010.

Occupational safety and health training for Refuge personnel is critical to maintaining an effective safety culture. As a result, the RSO coordinated with other agencies and helped sponsor a wide range of safety training for Refuge personnel during FY 2010 including eight-hour annual OSHA recertification for Hazardous Waste Operations, attended by Refuge personnel working directly in RMA remediation areas, certification and recertification training for most Refuge personnel in CPR (including the Automated External Defibrillator) and First Aid procedures, Hazard Communications and RCRA Waste Management training for Refuge personnel handling or managing hazardous wastes, periodic State and/or Federal pesticide applicator training for Refuge personnel applying pesticides, annual Fire Extinguisher Refresher training for all Refuge personnel, and initial certification or refresher training for appropriate Refuge staff operating heavy equipment, small motorized vehicles (four wheelers) and power tools (e.g. chainsaws).

The RSO and the Refuge Administrative Officer were involved in the final stages and closeout procedures of the Refuge Medical Monitoring Program. The risk of Refuge personnel potentially exposed to hazardous materials or conditions have been eliminated due to the final clean-up process at RMA for FY 2010. The RSO also coordinated confidential review of medical monitoring results for individual Refuge employees with the U.S. Army's contract Occupational Health Nurse who also performed respirator fit tests for Refuge staff. In addition, the RSO coordinated annual influenza vaccination for interested Refuge staff and Army employees who were offered influenza vaccine at no cost through the Army's contract Occupational Health Nurse. The RSO was prepared to coordinate appropriate diagnostic and medical treatment for any Refuge personnel injured on the job or exposed to hazardous materials or environmental hazards such as blood borne or vector borne pathogens, including disease agents transmissible from wildlife to humans. The RSO was also prepared to assist Refuge personnel in filing and processing valid Workman's Compensation Claims with the U.S. Department of Labor in coordination with the U.S. Department of the Interior.

RMA Refuge Medical Monitoring Program results from inception (FY 1989) through FY 2010 demonstrate the effectiveness of the Refuge safety culture in that **no out-of-range** exposure to chemical or environmental hazards has been reported among Refuge personnel. In addition, no blood borne or vector borne pathogen exposure has ever been documented among Refuge personnel, including results from FY 2010.

During Calendar Year 2010, Refuge staff logged 32,739 RMA Remedy-related work hours with **zero** recordable injury cases and **zero** "days away from work" cases. These results were incorporated into the overall safety and occupational health statistics reported by the RVO for the entire RMA Remedy workforce.

B.7.c. Other RSO Responsibilities/Activities

The RSO served as a Refuge point of contact and source of approval for RMA activities coordination through the Safe RAC database system and the Refuge contact for RMA traffic control warrants, traffic routing and control signage, and other issues related to safe motor vehicle operation on site. The RSO also had responsibility for overall coordination of, and safety compliance by, third parties proposing work on RMA for the Refuge, the National Wildlife and Eagle Property Repository, utilities operation and maintenance on Refuge facilities or lands, and work proposed on RMA within an easement granted to outside organizations for utilities, transportation, drainage or other purposes.

The RSO served as a member of the RVO Site-wide Infrastructure Transition Team (SITT) to help coordinate ongoing and future management of all RMA infrastructure assets such as structures, roads, utilities, dams, etc. The Refuge Safety Officer's institutional knowledge and diverse experience with RMA infrastructure was invaluable to SITT progress in resolving the transition of RMA infrastructure from an Army owned site to a National Wildlife Refuge. In 2010, the number and complexity of infrastructure and utilities-related transition issues handled by the SITT increased significantly because the RMA Remedy was nearing completion and RMANWR jurisdiction and responsibilities were expanding.

Another duty of the RSO was to coordinate and manage daily staffing of the South Gate entrance during workdays and special events, to maintain secure access for RMA workers and authorized visitors. During 2010, the RSO not only managed gate staff personnel under the USFWS but also two employees assigned from the Army staff. All employees working under the direction of RSO provided 99.5% of required Gate Guard coverage on the South Gate.

A final responsibility of the RSO was to provide technical and program evaluation of the PMC's performance under Category 8 Refuge Protection of the Incentive Award Fee Plan, serving as a Contracting Officer's Technical Representative (TR) to the U.S. Army's Contracting Officer. In this role, the RSO prepared monthly and semi-annual reports of the PMC's performance under three subcategories of Refuge Protection including Natural Resource Sensitivity, Activities Coordination/Environmental Protection, and Public Access Coordination. The RSO also attended monthly RVO TR Meetings to review PMC progress in achieving overall award fee objectives jointly developed with the RVO. During FY 2010, the RSO completed all monthly and semi-annual TR reports on time and participated in all TR meetings.

B.8. Participation in RVO Teams Working on Issues of Mutual Concern

B.8.a. Surface Water Management Team

During FY10, the RMA Refuge Remedy Coordinator continued to chair the RMA Surface Water Management Team (SWMT), charged with responsibilities for managing overall surface water supplies at RMA to meet annual and long-term water Remedy and Refuge requirements. Team members included RVO personnel from the U.S. Army, URS, RMANWR, and the U.S. Geological Survey, plus Engineering and Program Support personnel from the PMC. The SWMT met monthly during FY 2010 with a monthly meeting schedule and agenda topics developed by the team members and distributed by the Remedy Coordinator. The SWMT also developed and finalized a 2009 Surface Water Management Plan for RMA to ensure that RMA water supplies would meet or exceed anticipated demands.

One of the most significant accomplishments of the SWMT in FY 2010 was successful management of RMA water supplies to meet RMA water demands for remedy-related construction (dust control, compaction, and conditioning) and irrigation, plus RVO requirements for lake level management to support healthy aquatic ecosystems. Lake level management, coordinated by the SWMT, contributed to successful operation of the catch-and-release public fishing program sponsored by RMANWR in Lakes Ladora and Mary from mid-April to mid-October. Irrigated water needs were 448.6 acre feet, or roughly 6 inches over the summer, with 2 inches applied each month for 3 months. Lake level maintenance assisted in keeping all lakes at or near full-pool levels which was supplemented by section 4 groundwater wells. The total water demand to replenish evaporation and seepage losses was estimated at 699 acre feet per year (2010 Surface Water Management Plan). The estimated total water demand for Water Year (WY) 2010 was 1,162 acre feet of which the section 4 ground wells were to supply 859 acre feet.

In FY 2010, the SWMT continued to implement the *2008 RMA Nonpotable Water Lease Agreement* with the Denver Water Board that provides up to 800 acre feet per year of Denver tap water for dechlorination and discharge into Lake Ladora to replace historical delivery of non-potable water.

B.8.b Cultural resources- Rocky Mountain Arsenal Cultural Resources Management Team

The Rocky Mountain Arsenal National Wildlife Refuge (Refuge) actively participated in monthly meetings and related actions of the Cultural Resources Management Team (CRMT) to assure site-wide Remediation Venture Office (RVO) compliance with provisions of the National Historic Preservation Act (NHPA), the Antiquities Act, the Native American Graves Protection and Repatriation Act, and related Federal regulations. U.S. Fish and Wildlife Service (Service) representation on the CRMT included a regular team of members from the Habitat section and the Deputy Refuge Manager. CRMT activities during 2010 focused on continued implementation of the RMA Integrated Cultural Resources Management Plan (ICRMP) developed in 1994 and subsequently approved by the Colorado State Historic Preservation

Officer (SHPO). CRMT reported isolated cultural resource site locations found during field checks to Colorado SHPO as required by Federal regulation. In addition, the CRMT continued to manage curation of significant cultural resources recovered from South Plants, North Plants, Building 111 and other Refuge sites.

In FY 2010, the CRMT continued work started in 2008 on a Renovation Plan for the Egli house to restore the structure to original condition and provide future opportunities for the Service to provide historical interpretation of the Egli family farm for Refuge visitors. Friends of the Front Range Wildlife Refuges submitted a grant requesting funds to the Colorado State Historical Fund for restoration of the house, which was declined.

Due to conscientious attention to detail and solid follow-through by the CRMT in regular reporting to the SHPO of cultural resource finds at the Refuge, remedy projects experienced a record-setting **zero work delays** related to cultural resource finds at work sites. Based on the scale and distribution (horizontal and vertical) of Refuge sites necessarily disturbed by remedy project, this track record of zero work stoppage has set a 13-year record for others to follow at other construction projects.

Cultural Resource Activities – U.S. Fish and Wildlife Service

During the period of 1 October 2009 – 30 September 2010, compliance with the *National Historic Preservation Act of 1966* was achieved primarily by management of the Refuge under the provisions of a Programmatic Agreement (PA) with the Advisory Council on Historic Preservation (ACHP), which was originally signed in November 1998.

On 1 May 2010, an annual report was prepared for the ACHP and the Colorado SHPO on implementation of the terms of the existing PA during the preceding 12-month period, as required by the PA.

The terms of the existing PA are implemented in accordance with an ICRMP, which was originally prepared in October 1999. Throughout FY 2010, a revised ICRMP (approved during FY 2007) was consulted for cultural resources management at the Refuge.

Annual monitoring of historic properties found on the Refuge was in accordance with a stipulation in the PA (in the case of the prehistoric sites) and a separate Memoranda of Agreement (MOA) with the Colorado SHPO (in the case of the other properties) by a person or persons meeting at a minimum the *Secretary of the Interior's Professional Qualifications Standards* for archaeologists. FY 2010 field monitoring included:

5AM.185 (T2S R66W, Section 19 NW ¼): This site is located on the crest of Henderson Hill and contains at least two buried prehistoric components (Middle Archaic and Middle Ceramic periods). 5AM.185 occupies an estimated area of 7.45 acres. In 1997, impacts to 5AM.185 caused by past gravel quarrying, road construction, vehicle operation, and unauthorized collection of artifacts were reported to the Colorado SHPO. However, restriction of access and activities at the site since 1998 has eliminated these impacts, and permitted revegetation of most formerly exposed surfaces. During the 2006 monitoring visit, it was observed that the site remains in improved and stable condition, and there was no evidence of erosion or new impacts in FY 2010.

5AM.718 (T2S R66W, Section 20 NE ¼): This site is located on an unnamed hill over-looking Second Creek, and contains at least two buried prehistoric components (Archaic and Ceramic periods). The site occupies an estimated area of more than 8 acres (new areas of the site were mapped in 2003 and reported to the Colorado SHPO). In 1997, impacts caused by road construction on the eastern margin of the site were reported to the Colorado SHPO. The scarcity of artifacts observed here during monitoring visits conducted over the years since 2000 indicate that the 1997 assessment that "the site had been subject to significant damage" may have been incorrect. During the April 2010 monitoring visit, no artifacts were observed eroding out of the slope on the east margin of the site. Erosion of this slope has not been affected by the presence of the road, which lies further east. In general, the site is in good and stable condition.

5AM.1463 (T2S, R66W, Section 19 SE ¼): This site contains three buried concrete vaults constructed by the U.S. Air Force during the 1960s, reportedly for monitoring of foreign nuclear tests. The vaults are arranged in an extended triangle that occupies an area of roughly 0.2 acres. Each vault is cylindrical in form and measures approximately 5 ft. in diameter and 5 ½ feet in depth from the surface. In 2000, the vault complex was determined eligible for the NRHP in consultation with the Colorado SHPO, and a MOA was established for their treatment. The PMRMA placed a protective cover over the entrance of each vault in 2004.

5AM.1145 (T3S, R67W, Section 2 NW ¼): This site contains the Egli house and garage. The site was re-evaluated for NRHP eligibility by the PMRMA in January 2001. The Colorado SHPO concurred with the determination that the site was eligible for inclusion in the NRHP on the basis of criterion A of 36 CFR 60.4. In August 2002, the site was listed on the *Colorado State Register of Historic Properties.* The Egli house and garage are the only remaining pre-World War II buildings on RMA; they were constructed in 1910-1911 and inhabited by the Egli family until acquisition of property by the U.S. Army in 1942. In 2003, the Rocky Mountain Arsenal Wildlife Society undertook a historic structure assessment of the property with assistance from the PMRMA. The PMRMA signed an MOA in November 2005 for treatment of the Egli house and garage, which will be part of the Rocky Mountain Arsenal National Wildlife Refuge by the U.S. Fish and Wildlife Service.

5AM.1208 (T3S R66W, Section 6 SW ¼): This site contains the only remaining structure of the Munitions Storage Historic District, bunker Building 884. During the monitoring visit, it was observed that the roof (constructed in 1972) of the bunker was deteriorating and required some stabilization and repair. The roof was replaced in October 2010 with Army funds. In April, cultural resource team members noticed that due to the new roof, erosion was occurring because of poor drainage off the roof. FWS fixed the drainage problem by adding long irrigation pipe to redirect water.

5AM.261 (T3S R66W, Section 7): This site contains the Lateral A of the High Line Canal and has been determined eligible for the NRHP.

During FY10, one "unexpected discovery" was found: A historic site comprised of a well and associated water control structure probably built by the Black family for crop irrigation (5AM.2758). The reporting of unexpected discoveries is prescribed in the PA.

Prehistoric and historic artifacts were accessioned and curated in a collections center that is maintained on the Refuge in accordance with 36 CFR 79 under the terms of the PA. During FY 2010, artifacts were accessioned and catalogued in the RMA collections center, primarily to address a backlog of items that had accumulated during and prior to FY08.

The Service continues to work closely with the RVO CRMT, which includes representation from Planning and Habitat section staff. Throughout FY 2010, the CRMT met on a regular basis (at least once every 60 days) to review the progress of PA implementation and to address issues and problems in cultural resources management at the Refuge.

B.8.c. RVO Roads Team

The Refuge-funded RMA Refuge Highway Engineer participated in RVO discussions with the RVO Roads Team to provide a seamless interface between Remedy and Refuge roads at RMA. The RVO Roads Team met periodically during FY 2010 to coordinate oversight for removal of Remedy haul roads, to ensure convenient stockpiling and recycling of surplus roadway construction materials (recycled asphalt) for future use in construction of all-weather Refuge roads, funded by the Service's Refuge Roads Program. Members of the RVO Roads Team also provided technical assistance to develop a design scope of work for the all-weather Refuge roads network to facilitate construction of this network in 2010/2011. In FY 2010, pre-work began on 56th Ave. in May and road construction began on the area surrounding the new Visitor's center. New electrical service transformers were also installed in May.

B.9. Direct Administrative Support of Service Staff

B.9.a. Narrative of Activities

Implementation of Business Team Units for Refuges in Region 6 began October 1, 2009. Ruby Rodriguez was assigned as a Time Keeper and HR Specialist and Annette Ursini was assigned as a Budget Specialist. Ruby assisted Rocky Mountain Arsenal, Arapaho, Browns Park, Flint Hills, Kirwin, Marais des Cygnes, and San Luis Valley. Annette Ursini was assigned budget duties for Rocky Mountain Arsenal and Arapaho NWR.

The Department of Defense disabled all USB ports on computers attached to any DOD network at the beginning of November 2008.

Training/Travel

- Employees traveled to assist with the Gulf Oil Spill cleanup.
- CPR/1st aid classes were completed
- Visitor Services staff were all DOT certified with their CDL's
- Finished the Bison corral and purchased all supplies and material for the first round up in October 2011.

- Cassandra Bland attended Volunteer Recruitment training in San Francisco.
- Zach Kincaid attended Refuge Academy at NCTC; LE In-service in New Mexico, Taser training in Kirwin,
- Sherry Skipper attended SETAC and National EC meeting.
- Jennifer Taylor attended ESRi in San Diego
- Joel Colvin and Scott Whiteaker attended Maintenance Workshop.
- Terry Wright and Steve Berendzen attended Project Leader meeting in Montana.
- Six employees were recertified by attending Pesticide training in March 2010 (Colvin, Ronning, Whiteaker, Kutosky, and 2 others)
- Lisa Goncalves attended NCA Trails Accessibility.

Personnel

- Susan Drobniak salary split 50-50 between Refuges and Remedy funding to support RVO issues.
- SCEP – converted to Permanent appointments
- Lisa Brashear – SCEP student
- Lisa Goncalves – PCS move approved and transferred to RMA
- Jamie Lanier – transferred out
- Cassandra Bland transferred from Regional Office to RMA on 3/14/10
- Robert Blankenship retired 3/31/2010
- Gaylord Plaster retired 6/30/2010
- Richard Brunotte retired 9/30/2010
- William Briggs EOD as Fire Management Officer, GS401-11 on 12/9/2009
- Jason Fallon EOD 8/29/10 as Supervisor Range Tech Fire, GS-455-7
- Kayla Cable, STEP for Visitor Services, EOD 7/20/10 as GS-404-3
- Joel Colvin, New Term Biological Science Technician, EOD 5/9/10 as GS-404-7
- Tony Gutierrez transferred from RMA to Regional Office on 6/5/2010.
- Lindsey Messinger, Resigned on 2/26/2010
- Thomas Ronning, promotion to GS-485-11 on 7/18/10
- Edward Tagliente, EOD in permanent position, GS-025-7; 1/17/10
- Melissa VanDreese, promotion to GS-1701-11 on 7/18/10
- Abby Wright, EOD 5/26/10 as STEP for Visitor Services, GS-025-3

Orders

- Purchased Crusher fines for trails; 1261=$ 7,601 and Recreation Fee funds, 8081= $7601
- Purchased Fishing Signs with 1261 funds for $ 1,572
- Purchased three refrigerators with 1261 funds: $ 1,708
- Contracted Schroeder for biological consulting; $2000 with 1261 funds
- Purchased Prairie Dog Traps with 1261= $3,000 traps for bio-monitoring program: $2,734
- Purchased lots of material for Bison Corral and fencing from various vendors: $18,000
- Purchased 8 new 5 popup tents for $5883 using 1261 and 1262 funds

- Funded $5,000 to Texas A&M for Rocky Flat's Noxious Weeds with 1261 funds.
- Purchased Clay for discharge pond at new VC with 1261 funds; $ 2,645
- Purchased Bus wrap with 1262MAIN funds for $ 3,265
- Purchased Bulk Fuel for refuge $47,800 under all accounts
- Purchased new Gooseneck Trailer with 1261 for $14,000
- Purchased Canon Copier for new VC -1261 for $ 7,571; Bldg. 120 & 121 continued CASU lease for $5,884
- Purchases 9 new chairs with 1261 funds for $ 2,392
- Purchased LE Pickup truck with 1262B6RM for $31,186 and then added lights and Logos, winch and bumper for an additional $11,827 using 1264 funds
- Purchased Shuttle Van with 1262MAIN funds for $71,515
- Purchased Towable Gas Grill $ 5,944
- Contracted Taxidermy for Bison mount at new Visitor center-$ 8,050
- Purchased new cameras for Cameras in Action-$ 3,000
- Pelican cases (8) $ 2,444
- New fishing trailer for $915
- New Server for Refuge –in preparation of converting FWS from Army network (1263) $ 7,223
- Purchase LE radios from Tribalco for $5,595; and Nikon Field Scope with 1264 funds
- Purchased new mushroom shoes for Plow, $2,340 (Remedy funds)
- Purchased new binoculars (6) for Manager tours $1,080 (Remedy funds)
- Purchased Tomahawk traps for bio-monitoring program $2,734
- Purchase Order issued to AgAir for herbicide spraying $92,500
- Funded USGS for $7,400 with 1261-6BIO, for bison grazing study. Also panels for $2592 with Restoration funds
- Purchased native seed for $29,805 with Restoration Funds.
- Purchased herbicide for $51,698
- Interagency agreement with DOD Army Utilities, 1262-A6RM for $26,000
- Repairs and preventative maintenance on restoration vehicles and equipment $38,650
- Contract awarded to Purdy Manufacture for Roller Imprinter $36,610
- Purchased new 7230 JD tractor for $53,557 and new JD Shredder 115 for $10,050
- Purchased new presentation projector for managers, $650
- Purchased fish for lakes from Culver Fish Farm with Recreation Fee funds (8081) $9570.
- Additional order to Acquatics for $1340
- Visitor Center Construction; B&M Phipps; 2911-R6aa for $3,057,283
- Kimmel Mechanical – new furnace for bldg. 121; 4141-R6HZ=$3,958
- Benjamin Rush – Fence for Section 10; 2912-R6BJ = $50,110
- C3 Liability – Road contract 8555-60RM; $3,090,000, plus an additional $264,562 from station funds 1261 and 1263

<u>Property Received</u>

- Hazmat Trailer transferred in
- Purchased Plasma Cutter; $2977

- Purchases new Laminator; 1530
- Nikon Coolpix P90 camera $430; eight canon rebels each $500 -for Camera's in action
- Transferred in a Glock pistol; $335
- Purchased Blackberry Licenses (5) for station
- Purchased in Nikon field scope to upgrade LE camera-$1240
- Purchased towable BBQ grill; $5945
- New JD Flail shredder model 115; 10344
- 2011 Ford pickup; $31,187
- 2 Laptops each $2430
- JD 7230 tractor; $53,262 (traded in Ford and Case tractor/JD Rotary cutter)
- Transferred 2003 Krause 18' offset disk from Flint Hills NWR

Property Deleted

- Computers/monitors (32+16+servers)
- Software (Corel draw, Adobe PageMaker, and File Maker Pro)
- 1990 Elder Trailer
- Ice Machine
- Transferred 1995 stake bed truck to Alamosa NWR
- Sold 1996 Ford pickup w/Lab ($9950)
- Swisher mower

Projects: 2010 Accomplishment Report

- Energy Audits were done by Xcel Energy for Buildings 120, 121, 124 and 383. The primary recommendation for energy savings in all buildings would be to replace T12 fluorescent lighting with more energy efficient T8 fixtures. Most T12 fluorescent bulbs will no longer be manufactured after 2012. The Service will have to budget money to begin this changeover soon.
- Began construction of new Auto Tour Route through northern area of the Refuge. Project was begun in August 2010 with a completion date of April 2011. The project will resurface current paved roads on the Tour Route as well as construct new road segments. A bridge will be constructed across First Creek in Section 31 and a box culvert will be installed across First Creek at 9th Avenue. Approximate cost of the project is $3,354,562. Contract was awarded to C3 Limited.
- Contract awarded to Mountain States Recreation for installation of floating boardwalk across Lake Ladora in the amount of $66,224. Additional contract for netting $1300 and Interpretative panel was issued for $7,468. Total projected listed in RPI for $80,619
- RMA achieved a recycling rate of 52.35 % for 2010. We exceeded the DOI goal of 50% by 2015.
- Borrowed excavator from Monte Vista and rented crane to install final culverts at 9th Avenue and 1st Street Crossing. Total cost of project is $83,000.
- Removed parking lot at Bldg. 618 (SAMMS#10058142). Recycled asphalt.
- Replaced 6592' of perimeter fence on Northern Boundary of Section 10 (SAMMS #10053612).

Funding

- NIPA increase 2.5%. Business team funding added to base, actual salary/benefits and then 33% MC funds.
- Army Reimbursable Funding, Economy Act for Rocky Mountain Arsenal, overhead rate remains at 17%.

Cleanup/Remedy Funded	61170-1790-6000	$641,716
	Returned	($0)
	Total.....	**$641,716**
Mitigation/restoration Funded	61170-1790-6001	$1,465,921
	Returned	($215,000)
	Total.....	**$1,250,921**
Access Control Funded	61170-1790-6002	$96,246
	Returned	($34,000)
	Total.....	**$62,246**

Grand total of Army funding.....$**1,954.883**

U.S. Fish and Wildlife Funding

Wildlife and Habitat Management	Base	61170-1261-0000	$713,019
- Includes $7800 SCEP and $20,000 for Corral			
Base Maintenance	Base	61170-1262-MAIN	$218,227
- Shuttle Van			
Visitor Services	Base	61170-1263-0000	$929,181
- PCS Goncalves, Bobcat, new Server			
Law Enforcement	Base	61170-1264-0000	$119,770
Gulf Oil Spill		61170-1261-4OIL	
Inventory and Monitoring-USGS		61170-1261-6BIO	$ 7,400
- Cause and effect of bison impacts of veg resources			
Annual MMS		61170-1262-A6RM	$ 41,396
Small Equipment		61170-1262-B6RM	$ 32,000
- LE Pickup			
Jr. Duck Stamp		61170-1263-6JDK	$ 3,750
Volunteer		61170-1263-6VOL	$ 8,400
Youth		61170-1263-YUHT	$110,300
- Groundwork's-$30,000 & Mile High-$80,300			
VFE (includes material and installation)		61170-2821-EH30	$ 64,995
- Lake Ladora Floating Boardwalk netting $8,915			
- Interpretative Panels for Lake Ladora Signs $12,000			
Law Enforcement	Base	61170-1264-0000	$119,770
Recovery Act ARRA – GSA Transfer		61170-2694-E601	$2,890,573

Recovery Act ARRA – Construction of VC (B&M Phillips)	61170-2694-R6AA	$2,997,426
Recovery Act ARRA – Section 10 fence	61170-2912-R6BJ	$ 50,110
Recovery Act ARRA – furnace, bldg. 121	61170-4141-R6HZ	$ 3,958
Jr. Duck – Migratory Birds	61170-4524-6JDK	$ 876
Recycle Funds	61170-4557-0006	$ 8,566
Recreation Fee	61170-8081-0000	$ 10,459
- Rolled over $21,815.18, receipts=9510.10, expenses = $20865.82		
Contributed Funds from FY01 (Land Title Guarantee Co)	61170-7201-0560	$ 2,688
Contributed Funds from FY07 (Egli House)	61170-7201-0677	$ 2,280
Contributed Funds from FY05 (Commerce City)	61170-7201-6000	$ 15,720
Contributed Funds from RMA Wildlife Society-GO Wild	61170-7201-6004	$ 741
Contributed Funds Bison Fence from Shell (FY07)	61170-7203-6007	$ 4,000

B.10. Provision of Installation Maintenance Support in Skilled Trades

B.10.a. Heavy Equipment Operations Support

In FY 2010, the U.S. Army provided funding to cover labor and equipment operation costs for RMA Refuge Operations support to maintain site-wide unpaved roads, including periodic grading to restore acceptable road surface and drainage conditions, snow removal necessary to provide RVO/PMC and Refuge access, and maintenance as needed to remove storm-caused debris and sediment from unpaved roadways. This Army funding also covered snow removal during 5 storms by Refuge Operations around Buildings 120, 121 the parking area of the existing Refuge Visitor Center, the tram route, and Refuge Operations backup for snow removal on RMA paved roads and parking areas assigned to the PMC, as requested by PMC personnel.

FY 2010 Army funding for Refuge Operations support was also provided for maintenance projects that were conducted including 20 hours to repair the Havana pond dam, 16 hours of tree removal in Section 19 Project F27, along with 25 hours of tree removal in other areas. The funding also provided for 90 hours to work on the Rod and Gun club wetland restoration project with other projects including cleaning up the homestead in Section 23 and cleaning up debris from projects in Section 3.

B.10.b. Site-wide Communications Support

The Refuge Telecommunications Specialist provided comprehensive voice, data, and two-way radio communications support for all government and contactor organizations, facilities, and personnel located at RMA in FY 2010. This support included operation, maintenance, and management of off RMA fiber optic and copper cable plants to support numerous data and voice networks. The Telecommunications Specialist is the U.S. Army Base Communications Contract COR for RMA and works with coordination/compliance in the U.S. Army Communications Directorate at Ft Huachuca, AZ. The Telecommunications Specialist performed all system administration for voice/voice mail required for office moves, personnel departures and new hires for all organizations at RMA.

A brief summary of telecommunications support provided during FY 2010 includes:

- Provided the USFWS L.E. Special Operations Unit with technical assistance in moving from a temporary trailer location to a permanent office location, provided new voice and data network connectivity at this location, provided technical assistance with installing equipment to enhance cellular communications within office spaces.
- Assisted in the planning of telecommunication requirements for the new USFWS Visitor Center, extended fiber and copper cabling connectivity to provide voice and data connectivity. Provided all voice and data support necessary to move Visitor Services personnel into this facility.
- Installed new fiber and copper cabling to facilitate long term monitoring at a new site (Lime Basin) for the URS Group (contractor).
- Installed new fiber and copper cabling to connect new Building 887 with voice and data connectivity.
- Provided the Program Management Contractor / Tetratech with technical support in rerouting the fiber optic/data network to begin removal of trailers no longer required.
- Extended new T1 service from B-112 to the computer center at Building 129 to allow USFWS network migration from the U.S. Army to an independent USFWS data network.
- Provided briefings for U.S. Army Program Manager to facilitate long term telecommunications planning.